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OVERSIGHT HEARING: THE PRESIDENT'S FISCAL YEAR 2016 BUDGET REQUEST FOR THE NUCLEAR REGULATORY COMMISSION

HEARING

BEFORE THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

ONE HUNDRED FOURTEENTH CONGRESS

FIRST SESSION

APRIL 15, 2015

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ONE HUNDRED FOURTEENTH CONGRESS
FIRST SESSION

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C O N T E N T S

OVERSIGHT HEARING: THE PRESIDENT'S FISCAL YEAR 2016 BUDGET REQUEST FOR THE NUCLEAR REGULATORY COMMISSION

WEDNESDAY, APRIL 15, 2015

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
Washington, DC.

The committee met, pursuant to notice, at 10:08 a.m. in room 406, Dirksen Senate Building, Hon. James Inhofe (chairman of the committee) presiding.

Present: Senators Inhofe, Boxer, Barrasso, Capito, Crapo, Fischer, Sullivan, Carper, Gillibrand, and Markey.

OPENING STATEMENT OF HON. JAMES M. INHOFE, U.S. SENATOR FROM THE STATE OF OKLAHOMA

Senator INHOFE. The meeting will come to order.

We are holding this hearing to review the Nuclear Regulatory Commission's budget proposal for fiscal year 2016.

I would like to welcome Chairman Burns and the rest of you we have worked with in the past. It is nice to have you back. We are going to start getting active here.

We will continue with the committee's practice of 5-minute opening statements from Chairman Burns and 2 minutes for each of the others. Then we will start our questions. It looks like we will have pretty good attendance.

The NRC's mission is a vital one and must be adequately funded. I want our nuclear plants to be safe and they are safe, in spite of some of the things you might hear to the contrary.

However, resources are not unlimited. As the size of our nuclear industry shrinks, the NRC must recognize that it can accomplish its mission with fewer resources. In fact, it has done so in the past.

I conducted my first oversight hearing as Chairman of the Nuclear Safety Subcommittee in 1998. In 1998, this Commission had gone 4 years without any oversight. We changed that and started having 6-month reports. You are all very familiar with that. We go back a long ways on this.

In my opening statement, I am going to mention some things that no one is going to understand what I am saying except you at the table. You are very familiar with that and if you pay attention, I have a little challenge afterwards.

In 1997, we had 104 reactors operating in the U.S. and the NRC executed its safety mission with a budget of $477 million and 3,000 employees. Since then, we experienced the tragedy of September

11th and NRC expanded its efforts on security. A few years later, our Country seemed poised to experience a nuclear renaissance, which we were all very excited about, at least I was, and the NRC expanded to review a surge of applications for 31 new reactors.

Ten years ago, the NRC had a budget of $669 million and 3,108 employees to oversee 104 reactors and review 1,500 licensing actions. For fiscal year 2016, the NRC is requesting a budget of $1.032 billion and 3,754 employees to oversee 100 reactors and review 900 licensing actions.

After an increase of $363 million and 646 employees, the NRC is struggling with a backlog to review 40 percent fewer licensing actions. In 2005, the NRC reviewed 16 license renewal applications. In 2016, it plans to review nine.

In 2005, the NRC budgeted $69 million for preparing to review the Yucca Mountain application. We all remember that. For fiscal year 2016, the NRC has not requested any funding. In 2005, the NRC oversaw 4,400 nuclear materials licensees versus only 2,000 in 2016.

What we have seen over time is an agency that has grown in spite of a decreasing workload and now, unfortunately, a shrinking industry, something we hope to reverse and turn around.

These numbers tell us that the NRC has, in the past, accomplished more work with fewer resources. Last year, the Commission recognized the need to "right-size" the agency and instituted Project Aim 2020. Project Aim's recommendations include reducing the NRC's budget, and staffing levels 10 percent by 2020.

It is a nice start, but the NRC has performed far more efficiently in the past. I have seen the NRC accomplish more with less so I know it can do better. I do not think there is any reason to delay making changes to the agency's size and numbers until 2020. Certainly, the 2016 budget heads in the wrong direction.

Ninety percent of the NRC's budget is collected by fees recovered from its licensees. A lot of times that is used, saying these are not public dollars but it is the hardworking families who ultimately pay these costs in their electricity bills. They deserve prompt action to address the imbalances between your declining workload and the budget you have requested.

It is incumbent upon the NRC to ensure that these funds are used prudently and focused on achieving genuine safety benefits. I will have some specific questions to ask you along that line.

Senator Boxer.

[The prepared statement of Senator Inhofe follows:]

STATEMENT OF HON. JAMES M. INHOFE, U.S. SENATOR
FROM THE STATE OF OKLAHOMA

We are holding this hearing to review the Nuclear Regulatory Commission's budget proposal for fiscal year 2016. I'd like to begin by welcoming the commissioners and Mr. Burns who is testifying before us for the first time in his new role as chairman.

We will continue with the Committee's practice of a 5-minute opening statement from Chairman Burns and 2 minutes for each of the commissioners.

The NRC's mission is a vital one and must be adequately funded. I want our nuclear plants to be safe and they are safe.

However, resources are not unlimited. As the size of our nuclear industry shrinks, the NRC must recognize that it can accomplish its mission with fewer resources. In fact, it has done so in the past.

When I conducted my first oversight hearing as chair of the nuclear safety subcommittee in 1998, over 4 years had passed since the Committee had last conducted an oversight hearing with the NRC.

In 1997, we had 104 reactors operating in the U.S. and the NRC executed its safety mission with a budget of $477 million and 3,000 employees.

Since then, we experienced the tragedy of September 11th and NRC expanded its efforts on security. A few years later, our country seemed poised to experience a nuclear renaissance and the NRC expanded to review a surge of applications for 31 new reactors.

Ten years ago, the NRC had a budget of $669 million and 3,108 employees to oversee 104 reactors and review 1,500 licensing actions.

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Last year, the Commission recognized the need to "right-size" the agency and instituted Project Aim 2020. Project Aim's recommendations include reducing the NRC's budget and staffing levels 10 percent by 2020.

It is a nice start, but the NRC has performed far more efficiently in the past. I've seen the NRC accomplish more with less so I know it can do better.

I don't think there's any reason to delay making changes to the agency's size and numbers until 2020. Certainly, the 2016 budget heads in the wrong direction.

Ninety percent of the NRC's budget is collected by fees recovered from its licensees. However, it is hardworking families who ultimately pay these costs in their electricity bills. They deserve prompt action to address the imbalances between your declining workload and the budget you have requested.

It is incumbent upon the NRC to ensure that these funds are used prudently and focused on achieving genuine safety benefits.

OPENING STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR FROM THE STATE OF CALIFORNIA

Senator BOXER. Thank you very much, Mr. Chairman.

I welcome everyone.

Today, EPW is holding a hearing on the budget request for the Nuclear Regulatory Commission and also oversight and some management issues.

When I was chairman, we held 11 oversight hearings which were very important and informative, although I do not think they led to the action that we really have needed post-Fukushima which I will talk about. I do believe, as a result of those oversight hearings, this Commission has a new face. I am grateful for that.

Among the management issues I wish to explore today are the slow pace at which the NRC is implementing measures intended to protect American nuclear plants in the wake of the earthquake, tsunami, and nuclear meltdowns in Japan in March 2011. The reason I think it is so critical is I believe if you want a future for nuclear power, you have to have confidence or people are not going to allow it. I see this happening in my State because people are very worried. I will get to that in a minute.

I want to know today, you have not done really anything since Fukushima as far as I can tell. We do not really see any of the rec-

ommendations that came out being completely taken care of. I believe there were 12, were there not?

Senator INHOFE. I think we have 35.

Senator BOXER. Here are the ones, 12, that I am talking about. Maybe there were 35 but the top 12 here—no, no, no, nothing has been done. I want to know today is it because you do not have enough money, you do not have agreement or what is the story there? I am going to ask you that question.

Let me talk about what has happened in Japan. Here are the facts. Tens of thousands of refugees still remain barred from their former homes. There remains no solution for how to dispose of the massive volumes of radioactive waste accumulating at the plant.

Recently, the chief of the Fukushima power plant admitted that the decommissioning process could take—listen to this, Mr. Chairman—200 years and they had no idea what the conditions were inside the reactors because they are still too radioactive to examine. The technology needed to do the job does not even exist.

Just yesterday, a court in Japan sided with residents concerned about seismic safety when it prevented the restart of two Japanese reactors that have been shut down since the Fukushima disaster.

I believe the only way the nuclear industry can remain a vibrant part of our energy mix is if it has the confidence of the public. I said that at the opening of my statement and I want to say it again.

We have to learn from Fukushima and do everything we can to avoid having something similar happen here. The sad reality, again, is that not one of these 12 safety recommendations made by your own task force has been implemented.

Some reactor operators are still not in compliance with the safety requirements that were in place before Fukushima. The NRC has only completed its own action on four of the 12 recommendations. You have completed your own action but the industry has not completed any.

I remain concerned that you are not living up to your mission which is "to ensure the safe use of radioactive materials for beneficial civilian purposes while protecting people and the environment." That is your charge.

If we look at California's Diablo Canyon Power Plant to see that the NRC has failed to live up to its mission. I would like to place in the record a news article that appeared in the San Francisco Chronicle on March 7, 2015, entitled: "PG&E Overlooked Key Seismic Test at Diablo Canyon Nuclear Plant."

Senator INHOFE. Without objection.

[The referenced information follows:]

[The San Francisco Chronicle, March 12, 2015]

PG&E OVERLOOKED KEY SEISMIC TEST AT DIABLO CANYON NUCLEAR PLANT

(By David R. Baker)

Pacific Gas and Electric Co. replaced $842 million of equipment at the heart of the Diablo Canyon nuclear plant without first making sure the new gear could pass a vital seismic safety test required in the facility's license, The Chronicle has learned.

Starting in 2008, PG&E swapped out the plant's old steam generators and reactor vessel heads without evaluating whether the replacements could withstand a major

earthquake on the Hosgri Fault—just 3 miles away—and a simultaneous loss of cooling water within the reactors. Instead, PG&E evaluated each scenario—the earthquake and the loss of coolant—separately, even though Diablo's license requires that the two be considered together. A severe quake, after all, could rupture pipes connected to the reactor vessels and cause the water to drain, potentially leading to a meltdown.

PG&E spotted the mistake in 2011, a year after the last replacement equipment was installed at Diablo Canyon, perched on a seaside cliff near San Luis Obispo. The utility insists that its own analysis, performed after the company found the mistake, shows the new equipment would survive an earthquake and loss of coolant after all.

"Engineering and seismic experts performed a subsequent evaluation and confirmed there is sufficient margin in the components' design to withstand a very rare event of a combined earthquake on the Hosgri Fault and a loss of coolant accident," said PG&E spokesman Blair Jones. He called the possibility of such an event "infinitesimally small."

That doesn't comfort Diablo Canyon's critics, who have often accused PG&E of overstating the plant's strength and underestimating the seismic threats it faces. Earthquake safety has been a concern at the plant ever since the Hosgri Fault was discovered in 1971, 3 years after construction at Diablo began. Another fault that passes within 2,000 feet of the reactors, the Shoreline Fault, was found in 2008, after the plant had been operating for two decades.

"SAME MISTAKE" IN JAPAN

"I'm frightened that they're making almost the exact same mistake we saw at Fukushima," said Daniel Hirsch. a lecturer in nuclear policy at UC Santa Cruz.

The 2011 meltdown of three reactors at Japan's Fukushima Dai-ichi nuclear plant happened after an earthquake triggered a tsunami that swamped the plant, knocked out its power systems and led to a loss of coolant. The crippled plant still leaks radiation into the sea.

"There was a too-cozy relationship between the nuclear industry and regulators in Japan, and that led to the fiction that it was very unlikely that you'd have an earthquake and a tsunami and a loss-of-coolant accident at the same time," said Hirsch, who also serves as president of Committee to Bridge the Gap, a grassroots nuclear safety group.

The error comes to light as environmentalists, who tried to block Diablo's opening decades ago, are pushing hard to close the facility.

California's only other nuclear plant, the San Onofre Nuclear Generating Station, shut down in 2013 after a small leak of radioactive steam revealed serious problems with the station's own replacement steam generators, which had a different design than the original equipment. That doesn't appear to be an issue with Diablo Canyon, whose new steam generators feature the same basic design as their predecessors. But San Onofre's closure emboldened antinuclear activists.

"If key safety equipment has been installed using the wrong data, (Diablo Canyon) needs to be shut down, and we need a public, transparent investigation into the adequacy of the license and the safety of this plant," said Damon Moglen. senior adviser to the Friends of the Earth environmental group.

CRITICS BLAST REGULATORS

The plant's government regulators are a big part of the problem, critics allege.

The U.S. Nuclear Regulatory Commission, which oversees the nation's nuclear plants, should have caught PG&E's mistake before the new steam generators and vessel heads were installed, they say. Instead, the commission learned about the error from PG&E, reviewed the company's after-the-fact seismic assessment and agreed that the plant was safe. No fines or violation notices were issued.

Meanwhile, the California Public Utilities Commission, which gave PG&E permission to spend its customers' money on the replacement equipment, didn't know about the missed seismic test until told about it by a Chronicle reporter, a PUC spokesman confirmed. And since the Nuclear Regulatory Commission—not the state—is supposed to regulate nuclear plant safety, knowledge of the error would not have affected the PUC's decision, said spokesman Christopher Chow.

"This matter is within the jurisdiction of the NRC and not the CPUC," he said.

Friends of the Earth last year filed a lawsuit claiming the Nuclear Regulatory Commission illegally allowed PG&E to amend the seismic safety portion of its license without public hearings. The move came after one of the commission's own former inspectors at Diablo Canyon argued that the plant was no longer operating within the terms of its license and should be shut down until PG&E demonstrated

it could withstand earthquakes from several recently discovered fault lines, including the Shoreline. The commission rejected that idea.

"This is a regulator who's not prepared to regulate and didn't come down on a key safety issue," Moglen said. "It's a regulator who's looking the other way."

Earthquake fears have dogged Diablo Canyon throughout its history.

PG&E decided to locate a nuclear facility on the Central Coast after excavation for another proposed plant—at Bodega Bay, in Sonoma County—uncovered a fault line running through the site. When federal authorities approved construction of Diablo Canyon's first reactor, in 1968, the company said there were no active faults within 30 kilometers, or 18.6 miles, according to Hirsch.

Then oil company geologists reported finding the Hosgri, just offshore. The U.S. Geological Service estimated the fault could produce a magnitude 7.5 earthquake. It was just the first of several faults to be found in the nearby hills and seabed.

"With every study, we're finding that the seismic threat is larger than previously understood," said former State Sen, and Assemblyman Sam Blakeslee. who has a degree in geophysics and pushed for more earthquake studies at Diablo Canyon while in office. "It's remarkable that the facility was put here at all."

FAULT DISCOVERED

Hosgri's discovery in 1971 hardened public opposition to the plant and turned Diablo into a rallying point for America's nascent environmental movement. It also prompted regulators to require seismic retrofits to the plant before it could open. The work didn't go well. In 1981, PG&E discovered that some of the new seismic support structures had been built backward, in a mirror image of the way they were supposed to be.

Diablo Canyon finally opened in 1985. Its cost had spiraled from roughly $320 million to $5.8 billion.

Despite the price, California came to rely on Diablo Canyon. In 2011, for example, the plant's twin reactors supplied about 7 percent of the state's electricity, all without pumping greenhouse gases into the atmosphere. State officials worried about climate change saw it as a major asset.

The new steam generators were designed to keep that asset running smoothly. The generators convert heat from the reactors into steam that turns turbines to produce electricity. And over time, they wear out. Without replacements, PG&E told the state's utilities commission in 2005, the entire plant would have to close by 2014. The generators were replaced in 2008 and 2009 for roughly $700 million, a cost passed on to PG&E's customers.

The vessel heads—which cap each reactor and keep radiation from escaping—were replaced in 2010 and cost $142 million.

That same year, PG&E began an internal effort to examine all the plant's systems and ensure that the right safety analyses had been performed for each. Owners of other nuclear plants built during the same era as Diablo Canyon had already performed similar evaluations, some of them as far back as the 1990s. PG&E's effort, called the License Basis Verification Program, turned up the missed seismic test for new steam generators and vessel heads in May 2011.

The utility told the Nuclear Regulatory Commission about the mistake. PG&E conducted an assessment of the gear, all of it installed and in operation for several years at this point, and concluded it would meet the plant's seismic safety requirements.

NRC OKS ASSESSMENT

That satisfied the commission. Although PG&E is still finishing a final safety analysis for the equipment, the commission has reviewed PG&E's work and has raised no issues with it, said commission spokeswoman Lara Uselding. Nor has PG&E reported finding the same kind of mistake with any other equipment at the plant so far, she said.

The mistake remained out of public view, however, until last fall, when California Sen. Barbara Boxer started delving into seismic issues at the plant. In November, a commission official confirmed the mistake to a staff member of the Senate's Environment and Public Works Committee. Boxer alluded to it during a committee hearing in December on nuclear plant safety, in which she criticized the Nuclear Regulatory Commission's oversight of Diablo Canyon.

"Approximately 500,000 people live and work near this power plant, and it is my responsibility and yours to protect them," she told commission officials at the hearing.

Critics remain unconvinced by PG&E's—and the NRC's—assurances that the new steam generators and vessel heads are safe.

"What really worries me is that PG&E is doing with Diablo what it did with San Bruno," Hirsch said, pointing to the deadly 2010 explosion of a PG&E gas pipeline beneath the Bay Area city. "It's cutting safety corners and relying on the capture of its regulators to get through."

Senator BOXER. Thank you.

While the Fukushima Task Force recommended that all reactors be protected against the strongest earthquakes they were likely to face, the NRC seems to have gone out of its way to do the exact opposite.

Even after learning of newly discovered strong earthquake faults close to the power plant, the NRC dismissed its senior inspector's recommendation that the reactor be shut down if it did not come back into compliance with its own license, its own seismic licensing requirements. I am going to get into this as we get into the questions.

The fact is I represent a lot of people and a lot of people live around these plants. San Onofre had to shut down. NRC did not do what they should have done there and I am very fearful we are looking at the same thing in Diablo. I will question you on that.

Please let me know during your testimony whether you have enough money to do the job you are supposed to do or are you misusing it or using it on wrong things. I do not know. I need to hear, because this is a horrible record that after all these years, nothing of your own task force is happening on the ground now that you recommended—that they recommended.

[The prepared statement of Senator Boxer follows:]

STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR
FROM THE STATE OF CALIFORNIA

Today, the Environment and Public Works Committee is holding a hearing on the budget request for the Nuclear Regulatory Commission (NRC), fee recovery, and management issues.

Among the management issues I wish to explore today is the slow pace at which the NRC is implementing measures intended to protect American nuclear plants in the wake of the earthquake, tsunami, and nuclear meltdowns in Japan in March 2011. I'd be interested in the Commission's views about the reason for this slow pace, including budgetary constraints.

I welcome the new NRC Chairman, Steve Burns, as well as our other new Commissioner, Jeff Baran, to the Committee. It has been more than 4 years since the Fukushima disaster, and Japan has not been able to make sufficient progress in its clean up efforts. Tens of thousands of refugees still remain barred from their former homes, and there remains no solution for how to dispose of the massive volumes of radioactive water accumulating at the plant.

Recently, the chief of the Fukushima power plant admitted that the decommissioning process could take 200 years, that they had no idea what the conditions inside the reactors are because they are still too radioactive to examine, and that the technology needed to do the job does not even exist.

Just yesterday, a court in Japan sided with residents concerned about seismic safety when it prevented the re-start of two Japanese reactors that have been shut down since the Fukushima disaster.

The only way that nuclear energy can remain a vibrant part of our energy mix is if it has the confidence of the public. I have been saying for 4 years that in order to earn that confidence, we must learn from the Fukushima disaster and do everything we can to avoid something similar happening here in the U.S. Unfortunately, the reality is that not a single one of the 12 key safety recommendations made by the Fukushima Near-Term Task Force has been implemented at nuclear reactors in this country.

Some reactor operators are still not in compliance with the safety requirements that were in place before the Fukushima disaster happened. The NRC has only completed its own action on 4 of the 12 Task Force recommendations.

I remain concerned that the Commission is not doing all that it can to live up to the NRC's mission "to ensure the safe use of radioactive materials for beneficial civilian purposes while protecting people and the environment."

We need look no further than California's Diablo Canyon Power Plant to see that the NRC has failed to live up to its mission. I would like to place in the record a news article that appeared in the San Francisco Chronicle on March 7, 2015, entitled: "PG&E overlooked key seismic test at Diablo Canyon nuclear plant."

While the NRC's Fukushima Task Force recommended that all reactors be protected against the strongest earthquakes they were likely to face, the NRC seems to have gone out of its way to do the exact opposite at Diablo Canyon.

Even after learning of newly discovered strong earthquake faults close to the power plant, the NRC dismissed its senior inspector's recommendation that the reactor be shut down if it did not come back into compliance with its seismic licensing requirements.

Even after NRC learned that PG&E, which owns and operates Diablo Canyon, repeatedly failed to properly analyze earthquake risks when it replaced its steam generators and other major reactor equipment, NRC has not acted aggressively to enforce its own safety regulations.

And even when PG&E's own seismic analysis found an even more severe earthquake risk than was previously known, NRC still pronounced the reactor to be safe without even taking the time it needed to analyze these newly disclosed risks. In fact, I have learned that NRC drafted its press materials saying that its review of PG&E's seismic study said that the plant remained "safe to operate" weeks before PG&E even submitted the study to NRC in the first place.

I plan to raise these and other issues with you today, including the Commission's continued failure to provide me with documents I have requested.

Senator INHOFE. Thank you, Senator Boxer.

Mr. Burns, this is the first time you have appeared before this committee as chairman. You are recognized.

STATEMENT OF STEPHEN G. BURNS, CHAIRMAN, NUCLEAR REGULATORY COMMISSION

Chairman BURNS. Thank you, Senator. Good morning, Chairman Inhofe, Ranking Member Boxer and distinguished members of the committee.

My colleagues and I appreciate the opportunity to appear before you today to discuss the NRC's fiscal year 2016 budget request and the agency's current activities.

The proposed budget for 2016 reflects the NRC's responsiveness to the environment in which we find ourselves. Continuing with trends that began in fiscal 2014, the 2016 request reflects a reduction in both dollars and full-time equivalent staff from budget proposals in recent years, but still will provide the necessary resources to carry out the agency's mission to protect the public health and safety, common defense and security.

The proposed fiscal 2015 fee rule, which was published just recently on March 23 for public comment, is also expected to reflect a reduction in operating reactor fees from the proposed rule.

Ensuring timely implementation of safety enhancements at nuclear power plants as a result of the lessons learned from the accident at the Fukushima Daiichi plant in Japan continues to be a priority for the agency and will be in fiscal 2016.

The NRC and the industry continue to make substantial progress in implementing safety enhancements and the primary focus throughout this effort is beyond the implementation of the highest priority, most safety significant enhancements to maximize the safety benefit at nuclear power plants.

The NRC expects that most licensees will complete implementation of the majority of the most safety significant enhancements by

or before 2016. These include safety enhancements in the following areas: mitigation strategies, spent fuel pool instrumentation, flooding and seismic reevaluations and interim actions, enhancements to emergency preparedness communications and staffing.

Last year, the first plants completed implementation of the 2012 Mitigation Strategies Order which requires sites to be prepared to respond to beyond design basis events. More than half the plants are scheduled to achieve full implementation by the end of 2015 and the remaining, with limited exception, will complete the necessary actions in 2016.

Also, in the past year, both of the industry's National Response Centers in Phoenix, Arizona and Memphis, Tennessee became operational. Both centers contain multiple sets of emergency diesel generators, pumps, hoses and other backup equipment that can be delivered to any nuclear power plant in the United States within 24 hours.

From a broader perspective of NRC activities, we acknowledge that we are operating in a changing environment. Since 2001, the agency grew significantly to prepare for the projected growth in the use of nuclear power in the United States. That has not materialized, as Chairman Inhofe noted, to respond to the security aspects of the 9/11 terrorist attacks.

To address our changing environment, the agency launched Project Aim 2020 last summer to enhance the agency's ability to plan and execute its mission, while adapting in a timely and effective manner to a dynamic environment.

The NRC staff recommended to the Commission a number of measures designed to transform the agency over the next 5 years to improve our effectiveness, efficiency and agility. We are currently considering the staff recommendations as a commission and are taking a hard look at how to ensure the agency maintains the ability to perform its critical safety and security mission while being more efficient.

Although the NRC recognizes the need for change, we are also keenly aware that major organizational change, if not done wisely, can have a detrimental effect on the agency's mission and on the morale of its employees.

We have a critical mission and some of the most talented, dedicated and knowledgeable employees in the Federal Government. The Commission's priority must always be focused foremost on its safety and security mission, but in doing so, the Commission is cognizant of its changing environment and is committed to taking a hard look at itself to ensure that it is prepared for its future.

On behalf of the Commission, I thank you again for the opportunity to appear before you today. I look forward to continuing to work with you to advance our important safety and security mission.

I would be pleased to respond to any questions you may have. Thank you.

[The prepared statement of Chairman Burns follows:]

WRITTEN STATEMENT
BY STEPHEN G. BURNS, CHAIRMAN
UNITED STATES NUCLEAR REGULATORY COMMISSION
TO THE
SENATE ENVIRONMENT AND PUBLIC WORKS COMMITTEE
APRIL 15, 2015

Good morning, Chairman Inhofe, Ranking Member Boxer, and distinguished Members of the Committee. My colleagues and I appreciate the opportunity to appear before you today to discuss the U. S. Nuclear Regulatory Commission's (NRC) Fiscal Year (FY) 2016 budget request and the agency's current activities.

In January, the NRC marked its 40th anniversary as the independent Federal agency responsible for licensing and regulating the Nation's civilian use of radioactive materials to ensure protection of public health and safety, common defense and security, and the environment. The regulatory responsibilities assigned by Congress when the NRC was newly formed remain the same today, to protect public health and safety and to safeguard nuclear materials.

Our first years in existence as an agency, newly separated from the former Atomic Energy Commission and solely focused on safety and safeguards, were a period of transition. Even as we were establishing our regulatory footing as a new agency, we were quickly challenged by a destructive fire at the Browns Ferry plant, which led to the development of a new set of fire protection regulations, and by the accident at the Three Mile Island plant. As a result of that accident, the NRC placed greater emphasis on a variety of safety enhancements, including operator training and human factors engineering, emergency planning, and the collection and analysis of operating experience.

The civilian nuclear regulatory environment today is no less dynamic than it was 40 years ago. The terrorist attacks on September 11, 2001 marked another seminal event in the agency's history. Following the attacks, the NRC ordered nuclear plants to implement enhanced security measures designed to protect against an increased threat and increased public education of our emergency preparedness capabilities. More recently, the Fukushima Dai-ichi accident has caused the NRC and the industry to take significant actions to enhance the safety of nuclear reactors in the United States, which I will discuss in more detail in a moment. Today the NRC's regulatory program has been substantially strengthened, based in part on what we have learned from domestic and international operating experience. Our highly trained staff continues to provide extensive oversight of our reactor and materials licensees and perform comprehensive safety and environmental reviews of many, very complex licensing actions to determine that the proposed activities satisfy our regulatory requirements and are adequate to protect public health, minimize danger to life and property, and protect the common defense and security.

The resources that we are requesting for FY 2016 will allow the NRC to continue its licensing and oversight activities for commercial nuclear power reactors, research and test reactors, decommissioning and waste management activities, uranium recovery facilities, fuel facilities, and radioactive materials users, including those overseen directly by the 37 states, known as "Agreement States," that have agreements with NRC to assume regulatory responsibility for the use of certain radioactive materials. The funding request would support nuclear safety and security through our rulemaking, research, and enforcement efforts.

In FY 2016 the NRC has requested funding to review nine new reactor license applications and complete three of these reviews. Additionally, the FY2016 budget supports conducting inspections for four new reactors under construction -- Vogtle Electric Generating Plant, Units 3 and 4, and Virgil C. Summer, Units 2 and 3 – and to begin review of an anticipated small

modular reactor application. In FY 2016, the NRC also expects to complete the review of one construction permit application for a medical isotope production facility and conduct environmental and safety reviews of construction permits for two additional medical isotope production facilities.

A DYNAMIC REGULATORY ENVIRONMENT

Before I get into the specifics of the NRC's FY 2016 budget request, I wanted to briefly address the environment in which we now find ourselves. The September 2001 terrorist attacks emphasized the importance of security at nuclear facilities, and we experienced the expansion of our regulatory authority and an increase in security-related activities as a result of the passage of the Energy Policy Act of 2005. Since 2001, the agency has also grown significantly to prepare for the large projected growth in the use of nuclear power in the United States. The agency aggressively built the technical capability and infrastructure required to support the projected wave of new reactor license applications. While the NRC initially received applications seeking construction of 26 new reactors, most applicants have either withdrawn their applications or have requested that the NRC delay or suspend the licensing reviews of their applications. The NRC has also adjusted its forecast for new reactor activities downward in response to continuing changes in the nuclear industry.

Concurrently, as a result of other developments, the NRC began shifting resources to respond to changing priorities. Among our top priorities have been implementing lessons learned from the Fukushima Dai-ichi accident, resuming the review of the Yucca Mountain high-level waste repository with available carryover funding as required by the U.S. Court of Appeals for the District of Columbia Circuit, and addressing the unexpected number of nuclear power reactors that prematurely shut down and began decommissioning.

To address the 2012 D.C. Circuit ruling, the Commission established a special directorate with a dedicated group of staff and directed that a rule and a generic environmental impact statement on the environmental impacts of continued storage of spent nuclear fuel be completed within 24 months. The NRC met its deadline, after considering more than 33,000 written public comments, and issued a final "Continued Storage Rule" in September 2014 that addressed the generic effects of storing spent fuel at reactor and away-from-reactor sites following the expiration of a reactor's operating license until a permanent geologic repository for high-level radioactive waste becomes available. Once the rule was completed, the Commission lifted a suspension on final licensing decisions for applications for new reactors licenses, license renewals, and spent fuel storage facility renewals that rely on the rule.

Separately, to address the 2013 D.C. Circuit decision, NRC resumed its review of the Yucca Mountain license application using previously appropriated carryover funds. In January 2015, the staff completed and published the final volumes of the Safety Evaluation Report. In the report, the staff concluded that the Department of Energy's (DOE) application met regulatory requirements, except for certain requirements related to ownership of land and water rights. A supplement to DOE's environmental impact statement has not yet been completed. Accordingly, the NRC staff recommended against the Commission authorizing construction of the repository at this time. Now, at the direction of the Commission, the staff has begun work on a supplement to DOE's environmental impact statement to address the impacts of the proposed repository at Yucca Mountain on groundwater as well as the impacts from groundwater discharges to the surface. We expect to publish that supplemental environmental impact statement in the spring of 2016.

Before any decision can be made on the Yucca Mountain application, the supplemental environmental impact statement would have to be completed, a hearing would have to be held,

which presumes that the applicant will take an active role, and the Commission would have to complete its review of contested and uncontested issues. It is uncertain how long it would take to resolve the existing 288 issues that were admitted in the hearing (called "contentions"), not considering possible new or amended challenges. The agency's preliminary cost estimate for completing the license review and making a decision on whether to authorize construction of the repository is approximately $330 million. This estimate does not include any costs that DOE might incur as the applicant.

Another new development in the area of spent fuel storage is the notification to the NRC by Waste Control Specialists, LLC (WCS) that it plans to file, by April 2016, an application to construct and operate an independent spent fuel storage facility. WCS's notice to NRC came after our planning for the FY2016 budget, but NRC could reprioritize work to support a review of the application.

Oversight of decommissioning reactors is another area where NRC has experienced an unanticipated increase in workload. After 15 years without a power reactor permanently shutting down, five reactors recently closed before the end of their operating license term. While the NRC has extensive experience with regulating decommissioning -- 11 reactor licenses have been terminated since 1982 -- the NRC's current regulatory framework could be tailored to more specifically address the decommissioning of reactors. The transition to decommissioning has resulted in licensees' requests for exemptions from certain NRC regulations once their plants permanently ceased operations and have been defueled, to reflect the risk that is commensurate with the plant being permanently shut down.

In December 2014, the Commission directed the staff to proceed with a rulemaking on reactor decommissioning and set an objective of completing it by early 2019. The staff has begun work

on the regulatory basis for a decommissioning rulemaking. In order to complete the rulemaking, the agency may need to reallocate resources in FY 2016 and beyond. In the meantime, the staff will continue to process applications for decommissioning license amendments and exemptions until the rulemaking is completed.

FUKUSHIMA-RELATED ENHANCEMENTS

The requested FY 2016 resources support continued work on the highest-priority actions for post-Fukushima related activities, including seismic and flooding hazard reevaluations.

The NRC expects that most licensees will complete implementation of the majority of the most safety-significant enhancements by, or before, 2016. These include safety enhancements in the following areas: mitigation strategies; spent fuel pool instrumentation; flooding and seismic reevaluations and interim actions; and enhancements to emergency preparedness communications and staffing.

A key element of the post-Fukushima safety enhancements is the NRC's 2012 Mitigation Strategies Order, which requires licensees to ensure that sites are prepared to respond to beyond-design-basis external events. The Order includes requirements to procure additional equipment to maintain or restore core cooling, containment integrity, and to provide spent fuel pool cooling for all units at each site. In the past year, both of the industry's National Response Centers (in Phoenix, Arizona and in Memphis, Tennessee) have become operational. Both centers contain multiple sets of emergency diesel generators, pumps, hoses, and other backup equipment that can be delivered to any nuclear power plant in the United States within 24 hours. These response centers address a key element of the 2012 Mitigation Strategies Order, which is to provide sufficient offsite resources to sustain plant safety functions indefinitely.

Last year, the first plants completed implementation of the mitigation strategies requirements. More than half of nuclear power plants are scheduled to achieve full implementation by the end of 2015, with most of the remaining plants to be completed by 2016, as previously noted. Eight boiling water reactors have requested schedule extensions for parts of the mitigation strategies affected by the NRC's revision to the order on containment venting. During and after implementation of the mitigation strategies requirements, the NRC will conduct inspections to verify that nuclear power plants have put appropriate strategies in place to mitigate beyond-design-basis events.

Recently, the Commission approved the staff's recommendation that operating reactor licensees be required to address the reevaluated flooding hazards within their mitigation strategies for beyond-design-basis external events, including addressing specific flooding scenarios that could significantly damage the power plant site. The Commission also affirmed its intention to ensure that flooding hazards are fully understood for every site, but directed the staff to use a graded approach for determining the need for further assessments and to focus attention on plants where there is the greatest opportunity for additional safety enhancements. All but nine power plant sites have submitted their flooding hazard reevaluations.

Also in March, the NRC staff received the seismic hazard reevaluation reports and interim actions for the three western U.S. nuclear power plants – Columbia, Diablo Canyon, and Palo Verde. Plants in the central and eastern U.S. had previously submitted seismic hazard reevaluations. The NRC is reviewing these interim evaluations and actions. As part of its review, the staff is establishing a prioritization schedule for the seismic risk evaluations for the plants where the reevaluated seismic hazard exceeds its facility's design basis. This is the same process that the staff used in March 2014 when screening submittals for the central and

eastern U.S. plants. Plants that needed to perform additional analyses submitted their additional analyses in December 2014.

The NRC continues to assess the remaining Fukushima lessons learned items, the so–called Tier 2 and 3 issues. The Commission will be hearing from the NRC staff on the status of these activities during a Commission meeting scheduled for April 30.

REACTOR AND MATERIALS ACTIVITIES

NRC's budget request provides funding for the agency's oversight of the nuclear power reactor fleet to ensure it is operating safely and in accordance with NRC's rules, regulations, and license requirements. Currently, 96 reactors are operating in the highest two performance categories of NRC's reactor oversight process. Eighty of the 96 reactors were in Column 1 of NRC's Action Matrix because they fully met all safety and security performance objectives and are receiving a "baseline" level of NRC inspection. Sixteen reactors are in Column 2 and have an increased level of NRC oversight. One reactor is in Column 3, which is a performance category with a degraded level of performance. Two reactors are in Column 4 because of multiple instances of degraded performance with significant safety implications. Plants in Column 2 and higher receive increased levels of oversight.

The budget request also includes funding for a rulemaking to revise the regulations related to the medical use of byproduct material. These regulations were last amended in 2002. Over the past 12 years, stakeholders and members of the medical community have identified certain implementation issues. As a result, the NRC has proposed updates to its regulations to address technological advances and changes in medical procedures.

Separately, the agency has budgeted to continue research to confirm the safety basis for the release of patients who have received radiation treatment from medical facilities. While there is analytical information that our current requirements are protective of public health and safety, there is little empirical data on the doses actually received by members of the public exposed to treated patients. These gaps relate to internal doses to members of the public from close physical contact with patients or radioactive contamination from bodily fluids, and internal and external doses to members of the public from patients who go to locations other than their primary residences. In response to Commission direction, the staff is collecting limited empirical data to fill in any regulatory gaps. Also, the NRC staff is developing guidance related to patient release and evaluating whether regulatory changes to the patient release program are warranted. The staff anticipates holding multiple public meetings around the country to obtain input from stakeholders on these matters.

In FY 2016, the agency has budgeted for eight to 10 major license reviews of uranium recovery facilities. In February, Wyoming Governor Matthew Mead submitted a letter of intent to NRC, indicating that Wyoming had recently passed enabling legislation allowing it to become an Agreement State. Governor Mead stated that Wyoming intends to pursue an agreement with NRC to regulate byproduct material, specifically tailings or wastes produced by the extraction or concentrations of uranium or thorium from ore. Once the agreement request is submitted, the NRC staff will review the request and engage with the State to resolve any outstanding items. Prior to Commission approval and the signing of a final agreement, the NRC staff would prepare an assessment and issue a proposed agreement in the Federal Register for public comment.

FY 2016 BUDGET REQUEST

I would now like to highlight the specifics of the FY 2016 budget request.

The agency's proposed budget is $1,032.2 million, which includes the equivalent of 3,754 full-time employees (FTE).

The NRC is requesting $601.7 million for operating reactors, which represents an overall funding decrease of $10.4 million compared with the FY 2015 available resources. This funding level supports completing the highest-priority work related to implementation of the lessons learned from the nuclear accident at Fukushima, and reducing the number of pending licensing actions.

The budget request for new reactors is $191.7 million, a decrease of $5 million compared with the FY 2015 available resources. The decrease is a result of delays in application submittals and project slowdowns or suspensions of work on license applications.

The request for nuclear material users is $87.4 million, a decrease of $1.7 million compared with the FY 2015 available resources. The proposed budget also includes $43.8 million for spent fuel storage and transportation, a decrease of $2.4 million compared with the current funding level.

Two areas where the budget request has increased is for decommissioning and low-level waste activities -- $44.1 million, or $1.5 million above the FY 2015 budget – and fuel facilities activities -- $51.5 million, or an increase of $0.8 million above the FY 2015 level. The increases reflect greater resource needs to support oversight of decommissioning of power reactors and licensing activities for uranium recovery facilities.

In furtherance of our cost-saving efforts, the NRC has made cuts in overhead over the last five years. These cost-saving measures have resulted in an FY 2016 budget that accounts for

workload changes and allows the agency to fund inflationary and other necessary increases without an increase to the overall budget. The NRC's FY 2016 budget request reflects the Office of Management and Budget guideline of a 1.3 percent increase in salaries and benefits for a cost of living increase and accommodates routine contract cost escalations. The budget also adheres to commitments made for NRC's usage of building space for our employees.

The NRC Office of Inspector General's (OIG) component of the FY 2016 proposed budget is $12.1 million, including 63 FTE. The OIG budget includes approximately $11.2 million for auditing and investigation activities for NRC programs, and $1.0 million for the auditing and investigations services for the Defense Nuclear Facilities Safety Board.

FEE RULE

Under the provisions of the Omnibus Budget Reconciliation Act of 1990, as amended, the NRC must recover 90 percent of its budget through fees assessed to applicants and licensees, with the remaining portion of its budget appropriated for waste incidental to reprocessing activities, generic homeland security activities, and Inspector General services for the Defense Nuclear Facilities Safety Board. Accordingly, approximately $910 million of the FY 2016 budget request would be recovered from fees. This would result in a request for a net appropriation of $122.2 million.

The NRC's proposed FY 2015 fee rule, which was published on March 23, 2015, for public comment, includes estimates for reductions in licensee annual and hourly fees that we expect to be included in our final fee rule. For power reactors, the estimated annual fee is $4.75 million per reactor, which is down 5 percent from FY 2014. The NRC hourly rate is estimated at $268 in FY 2015, down from $279 in FY 2014. These decreases reflect a reduced FY 2015

appropriation from the requested level and the use of the carryover funding to supplement the FY2015 appropriations.

LOOKING AHEAD

Perhaps one of the most significant NRC undertakings to address our changing regulatory environment is the "Project Aim 2020" initiative. The NRC launched Project Aim 2020 in June 2014 to enhance the agency's ability to plan and execute its mission while adapting in a timely and effective manner to a dynamic environment.

The Project Aim 2020 team gathered perspectives from internal and external stakeholders to forecast the workload and operating environment in 2020. Based on analyses of these perspectives, and an evaluation of the NRC's current state compared with the anticipated future state, the staff identified key strategies and recommendations to transform the agency over the next five years to improve our effectiveness, efficiency, and agility.

The Commission considers this report to be an important step in the dialogue about the future of the NRC. We are currently deliberating on the report and are taking a hard look at how to ensure the agency maintains the ability to perform our safety and security mission while also being more efficient. We need to retain the appropriate skill sets to accomplish our mission, but we can improve on how we reprioritize activities based on emergent needs and can respond more quickly to changing conditions.

Project Aim 2020 is only one part of the self-assessment the NRC has undertaken in recognition of the changing regulatory environment. For instance, over the last several years, the Commission has revised its rulemaking processes to understand, and where possible, reduce, the cumulative effects of regulations. These processes include increased opportunities for

stakeholder interactions and feedback, publishing draft supporting guidance concurrent with proposed rules, requesting specific comment on the cumulative effects of regulations in proposed rules, and developing better-informed implementation timeframes.

In addition, the NRC has sought industry volunteers to perform case studies on the accuracy of cost and schedule estimates used in NRC's regulatory analyses. Based on those results, additional regulatory analysis process enhancements should improve cost estimating. We believe that applying these process enhancements will result in a better understanding of the implementation costs associated with new regulations for operating reactors.

With respect to cost-benefit analyses, the Government Accountability Office (GAO) recently completed a report that concluded the NRC needs to improve its cost estimating practices. Although the NRC did not agree with all of GAO's specific recommendations, we did agree generally that the NRC's regulatory analyses practices could be improved, and we have started to take steps, as described above, to do so.

In sum, as these examples have shown, the Commission is cognizant of our changing environment and is committed to taking a hard look at agency operations to ensure that we are prepared for the future.

CLOSING

Chairman Inhofe, Ranking Member Boxer, and distinguished Members of the Committee, this concludes my formal testimony on the NRC's FY 2016 budget request. On behalf of the Commission, I thank you for the opportunity to appear before you. I look forward to continuing to work with you to advance the NRC's important safety and security mission. I would be pleased to respond to any questions that you may have. Thank you.

The Honorable James Inhofe

QUESTION 1. **Several of the NRC's responses to the March 24, 2015, pre-hearing letter were inadequate. Please describe the process NRC uses to develop responses to questions posed by this Committee. Please include a listing of person/persons responsible for ensuring such responses answer questions completely, including fulsome cost information when requested.**

ANSWER.

The agency worked diligently over a limited time period to develop answers to the Committee's questions. Although staff worked to provide the information, in some cases, data is not available at the level of detail requested in the question. For those areas that you believe the responses were inadequate, we will continue to work with the Committee. The process described below is used in responding to Congressional questions.

Upon receipt of a letter from a Member of Congress or a Congressional Committee posing questions to the agency, the Office of the Secretary (SECY) assigns the development of a response to the appropriate office(s) for action. In this case development of responses to the Committee's questions was assigned to both the Office of the Executive Director for Operations (OEDO) and the Office of the Chief Financial Officer (OCFO), which coordinated with offices across the agency to prepare a response for review by the Commission and signature of the Chairman. SECY also identified which office would have the lead for responding to each question, and OEDO was assigned overall responsibility for preparing, coordinating, and reviewing the response package.

NRC staff in consultation with office management, prepares draft responses, which are then reviewed by the Office of General Counsel (OGC) before forwarding them to OEDO. OEDO staff reviews the draft responses and works with the Executive Director for Operations and deputies to obtain their approval. As OEDO had the staff lead for the agency response to the March 24, 2015, letter, OCFO provided its input to OEDO after OGC review.

OEDO prepared the cover letter, with support from OGC and the Office of Congressional Affairs.

OEDO provides the complete draft response package to SECY, which circulates it to all members of the Commission for their review and approval. The Chairman's office works with the other Commission offices to resolve any differences, and the response is then signed by the Chairman on behalf of the Commission.

The Honorable James Inhofe

QUESTION 2. **One of the questions from the March 24, 2015, pre-hearing letter was the following:**

"Post-Fukushima items have been categorized into 3 tiers, with the Tier 1 items carrying the greatest safety benefits. For each item in each tier, please provide the level of resources, both funding and staffing levels, budgeted for FY 2016." **Please provide the requested information.**

ANSWER.

The following table provides estimated funding and staffing levels of post-Fukushima activities for FY 2016.

		$K	FTE	Budget Total $K + FTE
Tier 1	Mitigation Strategies (EA-12-049)	$1,201	40.5	$7,924
	Containment Venting System (EA-12-050 & EA-13-109)	-	10	$1,660
	Spent Fuel Pool Instrumentation (EA-12-051)	-	5	$830
	Seismic Reevaluations	$800	20	$4,120
	Flooding Hazard Reevaluations	$2,200	25	$6,350
	Seismic and Flooding Walkdowns	Complete		
	Emergency Preparedness - Staffing and Communications	$100	2	$432
	Mitigation of Beyond Design Basis Events (formerly Station Blackout Mitigation Strategies & Onsite Emergency Response Capabilities)	$430	10	$2,090
	Containment Protection and Release Reduction (formerly Filtration and Confinement Strategies)	-	5	$830
Tier 2	Spent Fuel Pool Makeup Capability	Addressed in MBDBE Rulemaking		
	Emergency Preparedness			
	Other External Hazard Reevaluations	-	-	-

Tier 3	Periodic Confirmation of External Hazards	-	-	-
	Seismically-Induced Fires and Floods	$300	1	$466
	Venting Systems for Other Containment Designs	$500	3	$998
	Hydrogen Control	$500	1	$666
	Emergency Preparedness	-	1	$166
	Emergency Response Data System (ERDS) Capability	-	-	-
	Decision-making, Radiation Monitoring, and Public Education	-	-	-
	Reactor Oversight Process (ROP) Updates	-	-	-
	Training on Severe Accidents	$100	-	$100
	Emergency Planning Zone	-	-	-
	Potassium Iodide (KI)	-	-	-
	Expedited Transfer of Spent Fuel to Dry Cask Storage	Complete		
	Reactor and Containment Instrumentation	-	1	$166
		$K	**FTE**	**$K +FTE**
	FY16 Total	**$6,131**	**124.5**	**$26,798**

The Honorable James Inhofe

QUESTION 3. **Another of the questions from the March 24, 2015, pre-hearing letter was the following:**

"The CBJ makes reference to some 66 research projects without much clarity as to what level of resources each will consume or why they have been initiated. Please provide a list of all ongoing research projects in the NRC's Office of Research and any others within the agency. Please indicate how much each project has cost to date, how much is budgeted for each project for FY 2016, and an estimate to complete any projects that my extend beyond FY 2016. Please also indicate for each project whether it was initiated by NRC staff or as a result of Commission direction. Please rank this list in terms of quantitative risk reduction."

If these research projects are significant enough to warrant inclusion in the NRC budget, then it is appropriate for the NRC to track this information and provide it to this Committee.

a. Please provide a breakdown of the level of resources budgeted for research that is staff-initiated versus research that is Commission-directed.
b. If the NRC staff cannot describe the risk reduction related to these research projects, what is the basis for justifying the resources?
c. Please describe how research costs are apportioned among licensees for the purpose of fee recovery.

ANSWER.

a) While some research is Commission-directed, the majority of research activities are initiated through a formal request from the program offices to support regulatory decision-making. However, the Commission is cognizant of the agency's research activities and approves the annual research budget request. In addition, most staff-initiated research is intended to ensure that current regulatory requirements remain valid and continue to provide adequate safety in light of new information or to ensure that license amendment requests, if granted, do not unacceptably increase risk.

For the FY 2016 budget, $53M in contract support is requested for the Office of Nuclear Regulatory Research. Approximately 10 percent of the agency's research projects are Commission-directed, i.e., approximately $5M of the requested budget, while the level for staff-initiated activities is approximately $48M.

b) The NRC's Office of Regulatory Research primarily conducts independent confirmatory research. The majority of this research is intended to ensure that current regulatory requirements remain valid and continue to provide adequate safety margins in light of new information or to ensure that license amendment requests, if granted, do not unacceptably

increase risk. Thus, a major portion of the research performed is not for the purpose of risk reduction and does not result in quantitative calculations of risk reduction, but provides assurance that current regulatory requirements continue to provide acceptable margins of safety in light of new information that becomes available (e.g., operating experience). A summary of research activities currently under way, their objectives, and how they contribute to achieving NRC's mission is available in NUREG-1925, Rev 2, "Research Activities FY 2012 - FY 2014." This NUREG, which is currently being revised, is available in the NRC's Agencywide Documents Access and Management System (ADAMS) at Accession No. ML13242A030.

c) NRC resources are allocated to the appropriate category of licensees that benefit from NRC's activities. Most of the Office of Nuclear Regulatory Research's budgeted activities support the agency's oversight of operating reactors. Therefore, costs for this work are paid by the power reactor licensees as part of 10 CFR Part 171 annual fees. The remaining research activities, which support the agency's oversight of other categories of licensees, are paid as part of the annual fees applicable to those licensees.

The Honorable James Inhofe

QUESTION 4. **Chairman Burns testified: "*The proposed budget for FY 2016 reflects the NRC's responsiveness to the environment in which we find ourselves. Continuing with trends that began in fiscal 2014, the 2016 request reflects a reduction in both dollars and full-time equivalent staff from budget proposals in recent years...*"**

a) The Project Aim 2020 report indicates the NRC's current staffing level is 3,677 FTE excluding the Inspector General's Office. The NRC's 2016 budget proposal requests 3,691 FTE. Please explain how the NRC's FY 2016 reflects a reduction in staff.
b) Since NRC's FY 2016 budget request exceeds FY 2015 appropriations, please clarify which trends NRC is continuing.
c) Please describe how the NRC maintained a substantial amount of carryover spending at the end of FY 2014 in the same year the NRC billed operating reactors for a $100 million increase in fees.
d) Please provide the current estimate of funds the NRC expects to carry over from FY 2015 into FY 2016.

ANSWER.

a) The FY 2016 budget request included 3,678 FTE, not including the Inspector General's Office (OIG) or reimbursable FTE. The FY 2015 enacted FTE level was 3,733 FTE, not including OIG; the Project Aim 2020 report referenced an expected utilization of 3,677 FTE for FY 2015. The noted reduction in staff compares the FY 2016 budget request with the FY 2015 enacted budget. Based on current workload projections, the NRC is considering a reduction in FTE to approximately 3,600 in FY 2016, thus reducing FTE when compared with the FY 2015 request and enacted levels.

b) Congress authorized the NRC to supplement the FY 2015 Enacted Budget with unobligated carryover in the amount of $34.2 million for a total available budget of $1,049.5 million, which is larger than the FY 2016 request.

c) The NRC is required by law to collect from licensees and applicants approximately 90 percent of its budget authority by September 30 of each fiscal year. The NRC received its full appropriation late in the fiscal year, and thus informed Congress that it would not able to fully obligate all available funds, which created the carryover of unobligated funds. If fees in excess of the 90 percent requirement are collected one year (for example, due to unanticipated collections after the final rule was published), the following year's fee recovery would be reduced by an equivalent amount.

b) The agency currently projects to end FY 2015 with approximately $23 million in fee-based funds and $2 million in the Nuclear Waste Fund, for a total of $25 million in unobligated carryover.

The Honorable James Inhofe

Question 5. **Will the Commission commit to produce a FY 2017 budget request that reflects actual FY 2016 appropriations?**

ANSWER.

Yes to the extent practicable, although the timing of the appropriation affects the agency's ability to include the enacted appropriations for the prior year in the next year's Congressional Budget Justification.

The Honorable James Inhofe

QUESTION 6. **Will the Commission commit to produce a FY 2016 proposed fee recovery rule that reflects actual FY 2016 appropriations?**

ANSWER.

To ensure timely publication of the proposed fee rule and to allow sufficient time for public participation and for the NRC to issue the final fee rule before the year's end, the proposed rule is generally based on the President's budget. Due to the rulemaking time constraints, NRC will continue to reflect the President's budget unless there is an approved budget by Congress by the first quarter of the current budget fiscal year.

The Honorable James Inhofe

QUESTION 7. **According to the NRC's proposed fee recovery rule for FY 2015, the NRC expects to spend $422 million on corporate support this year.**

e) What are the major cost drivers in corporate support?
f) Please describe in detail the actions NRC is taking to bring corporate support costs under control

ANSWER.

e) The main Corporate Support budget drivers continue to be fixed costs in the category of general and administrative overhead, and include costs for facilities, security, IT infrastructure and telecommunications, as well as costs for major corporate information systems such as the agency's records management, acquisition, and core accounting systems. The FY 2015 Enacted Budget for Corporate Support totaled $370 million. Of the $370 approximately 84 percent was budgeted for general and administrative costs typically categorized as overhead, including rent, utilities, and facility maintenance; physical and personnel security; supplies and equipment; information technology (IT) infrastructure and agency information management (IM); finance and accounting; human resources; acquisitions; and training infrastructure. The remaining 16 percent of the Corporate Support budget funds centrally managed activities related to agency programs, such as international activities; agency outreach; and resources to support agency policy formulation, such as for the Commission the Secretariat, and technical advisory committees.

f) The NRC is committed to cost-efficient budgeting and the prudent use of resources to achieve the agency's mission objectives. The NRC has taken a hard look at overhead resources, reducing both FTE and contract support dollars through streamlining initiatives. Between the fiscal year (FY) 2011 Enacted Budget and the FY 2016 President's Budget, the agency achieved a reduction of 219 full-time equivalents (FTE) or $36.4 million in overhead. Centralization of corporate functions was a primary contributor to the decrease, while other contributors included the merger of the Office of Federal and State Materials and Environmental Management Programs and the Office of Nuclear Material Safety and Safeguards, and a decrease in the Regional office support staff.

In June 2014, the NRC embarked on Project Aim 2020. The purpose of the project was to identify ways to enhance the NRC's ability to plan and execute the agency's mission more efficiently while adapting in a timely and effective manner to a dynamic environment. The Project Aim report, which is currently being reviewed by the Commission, contains a number of recommendations that have the potential to further improve the efficiency of the NRC's internal processes and reduce corporate support requirements.

To assist in the continued streamlining of corporate support functions, the NRC contracted in February 2015 with EY (formerly, Ernst and Young) to conduct a review of the agency's overhead functions and to identify ways to reduce costs with no impact on the agency's ability to carry out its mission. The EY review, which involved interviews with and benchmarking against peer agencies, confirmed that there is no standard government-wide definition of overhead costs, but found that NRC overhead costs are roughly in line with peer agencies with respect to

the following standard corporate support cost categories used by the Federal Chief Executive Officers Council: acquisition, financial management, information technology, human capital, and real property. However, because of its mission, the NRC has additional security requirements that contribute to higher costs than peer agencies in areas such as physical and personnel security.

The April 30, 2015, EY report recommended that NRC take action to further reduce corporate support costs by implementing leading practices that have reduced overhead costs at peer agencies. The EY recommendations include, but are not limited to, centralizing budget execution activities in order to increase efficiency and reduce staffing requirements, continuing an initiative to consolidate data centers to reduce housing costs, streamlining the size and deployment of security staffing at NRC facilities to reduce costs, and conducting a cost-benefit analysis on outsourcing transactional mission support processes to evaluate opportunities for cost reduction through the use of external shared service providers. The EY recommendations will be evaluated by the agency as part of the implementation of Project AIM 2020.

The Honorable James Inhofe

QUESTION 8. **The NRC budget requests $127 million for information management and technology, roughly 10% of its total budget.**

g) Has the NRC benchmarked this level of spending with other independent agencies?
h) If so, please provide the results.

ANSWER.

g) Yes, as part of the Office of Management and Budget (OMB) FY 2014 PortfolioStat/Benchmarking process, the NRC was benchmarked for information and technology spending against six independent agencies, including the National Science Foundation, Environmental Protection Agency, Social Security Administration, Small Business Administration, National Aeronautics and Space Administration, and United States Agency for International Development. The OMB FY 2014 benchmark, OMB's most recent benchmarking exercise, included FY 2013 gross discretionary spending. The NRC will also support the upcoming OMB FY 2015 benchmarking review process.

h) Benchmark results show NRC's FY 2013 information management and technology spending level was at 14.7 percent, which was higher than the 6.2 percent government median and was ranked highest among independent agencies participating in the FY 2014 PortfolioStat/Benchmarking process. NRC is working with OMB to review the benchmark data in order to assess its comparability against the other agencies, specifically to determine whether the information provided by each of the other six agencies included the identical set of cost categories.

The Honorable James Inhofe

QUESTION 9. **How much money does the NRC spend on training each year?**

ANSWER.

Over the past five years (FY 2011 – FY 2015 projected), the NRC, excluding the Office of the Inspector General, has averaged $12.5 million in annual obligations for agency training.

The Honorable James Inhofe

QUESTION 10. **How much money does the NRC spend on travel each year?**

ANSWER.

Over the past five years (FY 2011 - FY 2015 projected), the NRC, excluding the Office of the Inspector General, has averaged $25.1 million in annual obligations for travel. The total does not include travel associated with employee relocations or reimbursable agreements.

The Honorable James Inhofe

QUESTION 11. **In 2005, the NRC IG reported that the NRC's Management Directive for budget formulation had not been amended since 1990 and was, "...thoroughly out of date."**

i. When will this management directive be updated?
j. Will the updated version provide the basis for developing the FY 2017 budget?

ANSWER.

i) The referenced Management Directive was actually a collection of all financial policies, not solely budget formulation policies. To make it more manageable, the NRC has split it into several individual Management Directives. The new, individual Management Directives are currently being coordinated to ensure consistency among them. One of the new Management Directives, entitled *Budget Formulation*, is currently in draft, and we anticipate that it will be issued in calendar year 2016.

j) The new *Budget Formulation* Management Directive will not be issued in time to include the basis for developing the FY 2017 budget. However, OCFO sends out detailed instructions to all organizational components of the NRC that are involved in formulating the budget. These instructions are preceded by a five-year planning process that focuses the agency's mission-directed programs and budget direction, on a longer-term view. The budget formulation process is also informed by specific annual budget guidance from the Commission. The annual budget instructions provide updated guidance to the NRC staff on all aspects of how the budget will be prepared, and include fiscal targets, important program considerations, Commission decisions, and government-wide direction from the Office of Management and Budget.

The Honorable James Inhofe

QUESTION 12. **In response to a question from Sen. Fischer, Chairman Burns stated:**

"My understanding, with respect to our views or the agency's views on the GAO's guidance, is that the particular GAO guidance was designed for basically, I think project construction and things like that, which are not quite a match for what we do ... While I disagree in terms of the issue on the GAO, I think we are ready and I think we have been trying to take some steps that address some of the concerns."

Please provide a detailed description of the actions being taken by the Commission and the staff to improve the NRC's cost estimating.

ANSWER.

The Commission has directed the staff to implement several regulatory analysis improvement programs to enhance NRC's cost estimating. In response to the staff's paper, "Implementation of the Cumulative Effects of Regulation Process Changes," dated March 12, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13071A635), the Commission directed the NRC staff to "perform case studies to review the accuracy of cost and schedule estimates used in NRC's regulatory analysis."

In response to Commission's direction, in 2013 the staff engaged the Nuclear Energy Institute (NEI), working on the industry's behalf, to select three regulations that affect the power reactor community to investigate the cost and schedule differences between the NRC estimates during development of the regulations and the industry results based on actual implementation (ADAMS Accession No. ML14069A061). In the final case study (ADAMS Accession No. ML14028A455), the following actions were recommended to NRC:

- Clearly define the scope, closure criteria, and characteristics so that realistic resources can be estimated for compliance with the new action or position;
- Obtain early public input in the rulemaking process to help accurately estimate the costs and benefits of the regulation; and,
- Include in the agency's regulatory analyses information on the basic assumptions and sources that drive the high-level estimates, and offer a range of estimates based on various sensitivities instead of single point estimates.

The NRC is addressing these recommendations. The NRC is establishing a clear understanding of the background, regulatory issue, objectives, scope, and affected entities as part of its evaluation when determining whether to initiate a proposed rulemaking. In addition, the NRC is performing, on a case-by-case basis, preliminary high-level cost estimates and backfitting assessments. These preliminary assessments provide an opportunity for the NRC staff to receive public input on the technical merits of prospective rulemakings as well as the estimated costs and benefits of either proceeding or not proceeding with the proposed rulemaking. The NRC publishes draft implementation guidance concurrent with the publication of proposed rules and final implementation guidance concurrent with final rules. Developing

implementation guidance concurrent with each rule will help ensure that the NRC and the industry have a common understanding of the effort required for a licensee to comply with the new requirement, and should also aid in developing cost estimates based on the expected method the licensee will use to achieve compliance with the proposed regulatory action. The NRC also is updating its cost-benefit guidance to incorporate feedback provided by licensees, NEI, stakeholders, and the U.S. Government Accountability Office (GAO), as well as direction from the Commission. These improvements are discussed in the staff's paper, "Plan for Updating the U.S. Nuclear Regulatory Commission's Cost-Benefit Guidance" (ADAMS Accession No. ML13274A495), and consist of a two-phase process for updating the NRC's cost estimating procedures. This first phase is expected to culminate with the release of draft guidance for public comment in the fall of 2015. This phase will consolidate guidance documents, incorporate recommendations from the GAO's 2014 report on the NRC's cost-estimating practices and cost-estimating best practices from the GAO's guide, as well as capture best practices for the consideration of qualitative factors in accordance with the direction the Commission provided to the staff in 2014. The second phase of the regulatory analysis update project will focus on addressing potential changes in policy and method used in regulatory analysis cost estimating, and will be a multiyear effort. These guidance updates will adhere to the following Commission-specified high-level principles:

a. The staff should continue to strive to improve its methods for quantitative analyses, including the treatment of uncertainties.
b. The staff should use the best information available to develop realistic estimates of the cost of implementing proposed requirements.
c. To ensure that qualitative factors are used in a judicious and disciplined manner, the revised guidance should continue to encourage quantifying costs to the extent possible and using qualitative factors to inform decision making, in limited cases, when quantitative analyses are not possible or practical (i.e., due to lack of methodologies or data).
d. To improve transparency and decision-making, any revised guidance should outline how the staff will articulate its rationale for the selection of qualitative factors and describe with specificity how these factors were used in the analysis, including the use of sensitivity analyses.

Finally, apart from these improvements to the NRC's internal cost estimation process, the NRC is contracting for the preparation of independent cost estimates. The NRC staff expects to pilot this independent cost estimate process beginning this summer with a power reactor regulation.

The Honorable James Inhofe

QUESTION 13. **In the NRC's response to GAO 15-98 regarding NRC cost estimating, Executive Director Mark Satorius stated:**

"The staff believes that OMB Circular A-4 is more appropriate for determining the adequacy of the NRC's cost estimates in regulatory analysis that the GAO's Cost Estimating and Assessment Guide, which is more appropriate to acquisitions of major systems."

However, the GAO addressed this in their report:

"OMB Circular A-4 discusses cost estimating at a very high level and does not go into great detail, whereas the Cost Guide provides much greater detail in terms of assessing the reliability of cost estimates. In addition, the Cost Guide includes best practices, from the private and public sectors, in cost estimating for capital assets. A filtered venting system consists of equipment and structures and is a type of a capital asset. The fact that the filtered venting systems will be acquired by licensees, and not NRC, does not change the importance of producing reliable cost estimates. Furthermore, as we noted in the report, we did not assess NRC's estimate against best practices that we determined did not apply to an estimate performed for regulatory purposes."

The nuclear industry anticipates spending approximately $4 billion to address post Fukushima regulatory changes. For the NRC's 35 post-Fukushima regulatory changes, please provide a list indicating which changes involve capital assets. For each item in the list, please describe why GAO's *Cost Estimating and Assessment Guide* would not be relevant.

ANSWER.

Each of the NRC's 41 post-Fukushima items[1] along with their status, the full NRC resources budgeted for FY 2016, and the NRC's assessment of whether these items could involve the procurement of new industry capital assets, are provided below in Table 1. These capital assets include land; structures; equipment; instrumentation and controls; information technology hardware; and intellectual property, such as software. For those items, cost-estimating methods contained in the U.S. Government Accountability Office (GAO) *Cost Estimating and Assessment Guide* are relevant. An additional 16 recommendations are currently being evaluated by the NRC to determine if additional regulatory action is necessary; as such, it is too early to determine if resolution of those recommendations will involve industry capital assets.

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[1] Table 1 lists the 35 Fukushima lessons-learned items identified in the NRC's Near-Term Task Force (NTTF) report, along with the six additional lessons-learned items identified by the NRC staff or other stakeholders subsequent to issuance of the NTTF report.

The NRC staff is updating its cost-benefit guidance to incorporate feedback provided by licensees, NEI, stakeholders, GAO, and direction from the Commission. Updating the guidance and improving the accuracy of the agency's quantitative estimates are priorities for the NRC. To improve and benchmark NRC's current cost estimates, the NRC is contracting for the preparation of independent cost estimates. The NRC staff expects to pilot this independent cost estimate process beginning this summer with a power reactor regulation.

Table 1 – Status of Post-Fukushima Lessons-Learned Activities

NTTF Rec.	Recommendation	Involve Industry capital assets	Status	FY 16 Budget		
				FTE	Contract ($K)	Total ($K + FTE)
1.1	Commission Policy Statement on risk-informed defense in depth framework.	No	Closed per Commission direction and incorporated into ongoing risk management initiatives.	-	-	-
1.2	Initiate rulemaking consistent with the Commission Policy Statement.					
1.3	Modify Regulatory Analysis Guidelines.					
1.4	Evaluate the insights from the Individual Plant Examination and Individual Plant Examination of External Events efforts.					
2.1	Reevaluate seismic and flooding hazards against current requirements and guidance and update the design basis; take appropriate regulatory action to resolve issues associated with updated site-specific hazards.	TBD	Seismic and flooding reevaluations in progress. Estimated completion in the 2019 - 2020 timeframe. Work is ongoing to improve schedules and ensure that mitigating strategies can be implemented under reevaluated hazard conditions by the compliance date.	Seismic:		
				20	$800	$4,120
				Flooding:		
				25	$2,200	$6,350

NTTF Rec.	Recommendation	Involve Industry capital assets	Status	FY 16 Budget		
				FTE	Contract ($K)	Total ($K + FTE)
2.2	Periodic confirmation of seismic and flooding hazards.	TBD	Pending outcome of work on Recommendation 2.1.	-	-	-
2.3	Perform seismic- and flood-protection walkdowns to verify compliance with existing seismic and flooding design bases.	No	Complete.	-	-	-
3.0	Potential enhancements to the capability to prevent or mitigate seismically induced fires and floods.	TBD	Tier 1 – Risk analysis tool to be completed in 2015. Tier 3 – Disposition pending completion of Tier 1 aspect.	1	$300	$466
4.1	Rulemaking to codify requirements for capability to maintain plant safety throughout a prolonged station blackout.	Yes	In progress. SECY-15-0065, "Proposed Rule: Mitigation of Beyond Design Basis Events," was sent to the Commission at the end of April 2015 and is currently under review. Although many of the capital assets are attributed to Rec. 4.2.	10	$430	$2,090
4.2	Provide a three-phase approach for mitigating beyond-design-basis external events (Order EA-12-049).	Yes	In progress. Plants are currently implementing the order, with the majority of plants to be in compliance by the end of 2016. These requirements are also being made generically applicable as part of the proposed rule for Rec. 4.1.	40.5	$1,201	$7,924
5.1	Provide a reliable hardened containment vent system for boiling-water reactors with Mark I and II containments (Order EA-13-109).	Yes	In progress. Phase 1 (wetwell vent) is scheduled for completion by mid-2018 and Phase 2 (drywell venting) is scheduled for completion by mid-2019.	10		$1,660

NTTF Rec.	Recommendation	Involve Industry capital assets	Status	FY 16 Budget		
				FTE	Contract ($K)	Total ($K + FTE)
5.2	Reliable hardened vents for other containment designs.	TBD	Evaluation to determine if additional regulatory requirements are needed is in progress.	3	$500	$998
6.0	Hydrogen control and mitigation inside containment or in other buildings.	TBD	Evaluation to determine if additional regulatory requirements are needed is in progress.	1	$500	$666
7.1	Provide a reliable indication of water level in spent fuel storage pools.	Yes	In progress. Plants are currently implementing the order, with the majority of the plants to be in compliance by the end of 2016.	5	-	$830
7.2	Spent fuel pool makeup system enhancements.	Yes	Subsumed into work on Tier 1 Recommendations 4.1 and 4.2.	-	-	-
7.3	Revise technical specifications for spent fuel pool requirements.	No	Subsumed into work on Tier 1 Recommendations 4.1 and 4.2.			
7.4	Seismically-qualified means to spray water into the spent fuel pools.	Yes	Subsumed into work on Tier 1 Recommendations 4.1 and 4.2.			
7.5	Initiation rulemaking or licensing activities related to 7.1–7.4.	Yes	Strategies and guidelines to maintain or restore spent fuel pool cooling are part of the proposed rule in item 9.			
8.1	Modify emergency operating procedures technical guidelines.	No	Subsumed into work on Tier 1 Recommendations 4.1 and 4.2.	-	-	-
8.2	Modify standard technical specifications.	No	Subsumed into work on Tier 1 Recommendations 4.1 and 4.2.			
8.3	Order licensees to modify each plant's technical specifications.	No	Subsumed into work on Tier 1 Recommendations 4.1 and 4.2.			

NTTF Rec.	Recommendation	Involve Industry capital assets	Status	FY 16 Budget		
				FTE	Contract ($K)	Total ($K + FTE)
8.4	Training and exercises Severe Accident Management Guidelines and Extensive Damage Mitigation Guidelines.	No	Training and drills or exercises needed to provide assurance of SAMGs are part of the proposed rule for Rec. 4.1.			
9.1	Emergency preparedness enhancements for multiunit events.	Yes	Subsumed into work on Tier 1 Recommendation 4.1.	-	-	-
9.2	Emergency preparedness enhancements for prolonged station blackout.	Yes	The NRC did not separate extreme events into multi-unit events and prolonged SBO events, and instead simply addressed these as beyond design basis external events that impact the entire reactor site. As such this item is addressed together with Recommendation 9.1 and is part of the proposed rule in item 9.	-	-	-
9.3	Orders to improve off-site emergency preparedness.	No	Subsumed into work on Tier 1 Recommendations 4.1 and 4.2.	2	$100	$432
9.4	Complete the emergency response data system modernization initiative to ensure multiunit site monitoring capability.	Yes	Complete. The proposed rule in item 9 would revise the regulations to reflect this action and remove references to technology.	-	-	-

NTTF Rec.	Recommendation	Involve Industry capital assets	Status	FY 16 Budget		
				FTE	Contract ($K)	Total ($K + FTE)
10.1	Analyze current protective equipment requirements for emergency responders and guidance based upon insights from the accident at Fukushima.	TBD	The evaluation of this recommendation is scheduled to start in 2016.	1	-	$166
10.2	Evaluate the command and control structure and the qualifications of decision-makers to ensure that the proper level of authority and oversight exists for a long-term station blackout or multiunit accident or both.	TBD	The evaluation of this recommendation is scheduled to start in 2016.			
10.3	Evaluate the capability of emergency response data systems and make improvements as needed.	TBD	The evaluation of this recommendation is scheduled to start in 2016.			
11.1	Study whether enhanced onsite emergency response resources are necessary to support the effective implementation of the licensees' emergency plans.	TBD	Combined with actions on Recommendations 10.1–3. The part of this recommendation associated with the delivery of offsite assistance to the site is addressed in the proposed rule in item 9.	-	-	-
11.2	Evaluate insights from Fukushima to identify potential enhancements to the U.S. decision-making framework.	TBD	Combined with actions on Recommendations 10.1–3.			
11.3	Study the efficacy of real-time radiation monitoring onsite and within the emergency planning zones.	TBD	Combined with actions on Recommendations 10.1–3.			

NTTF Rec.	Recommendation	Involve Industry capital assets	Status	FY 16 Budget		
				FTE	Contract ($K)	Total ($K + FTE)
11.4	Training in the local community.	TBD	Combined with actions on Recommendations 10.1–3.	-	-	-
12.1	Reactor Oversight Process modifications to reflect the recommended defense-in-depth framework.	No	The Reactor Oversight Process modifications do not impose requirements for new industry capital assets.	-	-	-
12.2	NRC staff training on severe accidents and resident inspector training on severe-accident management guidelines.	No	The training seminars are for NRC staff.	-	$100	$100
Other	Containment Protection and Release Reduction Rulemaking, which addresses filtering strategies and codifies requirements of Order EA-13-109.	Yes	The proposed rule is scheduled to be sent to the Commission in 2016.	5	-	$830
Other	Reevaluate other natural external hazards against current requirements and guidance and update the design basis; take appropriate regulatory action to resolve issues associated with updated site-specific hazards.	TBD	This item is pending further study and the outcome of work on Recommendation 2.1.	-	-	-
Other	Revisit emergency planning zone size.	TBD	This item is pending further study.	-	-	-
Other	Pre-stage potassium iodide beyond 10 miles.	TBD	This item is pending further study.	-	-	-
Other	Expedited transfer of spent fuel to dry cask storage.	No	Closed per Commission direction. The requirement to expedite transfer of spent fuel to dry cask storage was found not to be justified.	-	-	-

NTTF Rec.	Recommendation	Involve Industry capital assets	Status	FY 16 Budget		
				FTE	Contract ($K)	Total ($K + FTE)
Other	Reactor and containment instrumentation capable of withstanding beyond-design-basis conditions.	TBD	The evaluation of need for regulatory action is scheduled to be completed by the end of 2015.	1	-	$166
			FY 2016 Total:	124.5	$6,131	$26,798

The Honorable James Inhofe

QUESTION 14. **In his response to GAO 15-98, Mr. Satorius also stated:**

"While the staff agrees that it should pursue improvements to our cost estimating procedures, the NRC must meet its statutory obligations and the use of OMB guidance and our existing processes best support this objective."

k. Given the NRC is known for underestimating costs by hundreds, if not a thousand, percent, please explain why the NRC would reject GAO's best practices in favor of its own existing processes.
l. Given how accurate cost estimates are fundamental to NRC's decision making, please explain why the NRC rejected the best practices embodied in the GAO's *Cost Estimating and Assessment Guide.*

ANSWER.

The NRC did not reject GAO's best practices in favor of its own existing processes nor reject the best practices contained in GAO's *Cost Estimating and Assessment Guide*. The NRC is revising its guidance to incorporate relevant GAO's cost estimating best practices. One of GAO's recommended best practices is to develop estimates based on a work breakdown structure using detailed task and cost information. The NRC does not have detailed or aggregate cost information for most of our regulated entities (or access to such information), so it cannot completely implement this GAO best practice. If regulated entities provided publicly-available detailed cost information for a prospective NRC regulatory action (*e.g.*, during the proposed rule public comment period), then the NRC could refine its cost estimates to account for the detailed cost information. However, until recently, the NRC's experience is that external stakeholders rarely provide cost information of sufficient quality to support refinement of the NRC's cost estimates.

Regarding the accuracy of NRC cost estimates, the agency, working with industry representatives, conducted case studies of three selected cost-benefit analyses to identify lessons learned that could be used to improve the NRC's cost-benefit analyses. The results of the case studies show that there was significant divergence between the costs estimated before the regulation was issued compared with the actual costs incurred by regulated entities after the final rule was published. Typically, this divergence resulted from different assumptions made by the NRC and the regulated entities regarding the change from the status quo resulting from the new requirement. Other contributors to differences in estimated versus actual costs include differing assumptions on how a licensee will achieve compliance, different timing of compliance, variability between plant sites, and lack of industry cost data, among others. The NRC also has been advised that the regulated entities consider some types of cost data to be proprietary information, which they wish to withhold from public disclosure.

The NRC is taking several actions to address the recommendations from the case studies to more accurately estimate costs. First, the NRC now publishes draft implementation guidance concurrent with the publication of proposed rules and final implementation guidance concurrent

with final rules. Developing implementation guidance concurrent with each rule will help ensure that NRC and industry have a common understanding of the effort required for a licensee to comply with the new requirement, and should also aid with developing cost estimates based on the expected method the licensee will use to achieve compliance with the proposed regulatory action. Second, the NRC staff is working with nuclear power industry stakeholders to explore possible ways in which these stakeholders can provide more detailed information on implementation costs to the NRC in a way that minimizes the use of non-public information. Third, the NRC is estimating the cost-benefit of prospective regulatory actions before beginning rulemaking to understand potential licensee impacts and to collect cost data earlier in the process. Developing cost-benefit information for prospective regulatory actions before beginning rulemaking provides an opportunity for the stakeholders to provide values and impacts that would be used to inform the NRC decision on whether to proceed with the regulatory action.

The NRC generally agrees with the GAO's recommendation contained in its December 2014 report that the agency could improve its regulatory analyses, noting that improvement activities are in progress.

The Honorable James Inhofe

Question 15. **The NRC's FY 2014 fee recovery rule stated:**

"The annual fees for power reactors increase primarily as a result of: (1)Decreased 10 CFR Part 170 billings due to the decline in current year licensing actions and delays in major design certification applications and combined license applications (this decline in 10 CFR Part 170 fillings means that 10 CFR Part 171 fees need to increase to make up the difference and ensure that the NRC collects approximately 90 percent of its budget authority); (2) increased generic regulatory work related to domestic post-Fukushima regulatory actions and the development of the new waste confidence rule, which the NRC cannot bill to a specific licensee; and (3) the shutdown of two operating reactors (San Onofre Nuclear Generating Station, Units 1 and 2), which lowered the number of licensees in the annual fee class."

According to this, fees on operating reactors increased due in part to a shortfall in billable work in the Office of New Reactors. The NRC's FY 2016 budget proposal indicates the Office of New Reactors expects to review a total of 16 applications including design certifications, combined licenses, and early site permits. Based on a review of the NRC's responses to pre-hearing questions and the NRC's website, it appears NRC will only be reviewing a total of 10 applications in FY 2016.

m. Given the NRC has over-budgeted for the Office of New Reactors, how will the NRC avoid forcing operating reactors to pick up the tab for the shortfall in New Reactors' revenue next year?
n. What actions is the NRC taking to more accurately budget for the Office of New Reactors?

ANSWER.

m) The NRC is required by law to collect approximately 90 percent of its budget authority *in the year appropriated* through fees from its licensees. Annual fees (10 CFR Part 171) are billed to the categories of NRC licensees and certificate holders to collect the NRC's recoverable budget authority not collected from fees for licensing and inspection services (10 CFR Part 170). When the licensing and inspection fees decline, the NRC must, in compliance with applicable law, raise annual fees in order to recover the allocated budgetary authority for the power reactor fee category.

n) The budget for the New Reactors Business Line has been responsive to the declining workload. The NRC continues to closely monitor the existing workload and budget appropriately in this changing environment.

The Honorable James Inhofe

QUESTION 16. **Over the last 3 years, 5 reactors have transitioned from operations to decommissioning. The NRC's proposed fee recovery rule for FY 2015 states:**

"The permanent shutdown of the Vermont Yankee reactor decreases the fleet of operating reactors, which subsequently increases the annual fees for the rest of the fleet."

The NRC's response to the five permanent shutdowns has simply been to divide the fees by a smaller number of operating reactors, forcing the remaining reactors to pay more.

o. Please explain whether this practice is consistent with fair administration as embodied in NRC's Reliability principle?
p. As the industry shrinks, please explain why this cycle of ever-increasing regulatory burden on the remaining reactors is sustainable.
q. If there is a threshold beneath which this practice is no longer sustainable, please indicate the number of reactors that would represent such a threshold.
r. Please explain why the NRC's decommissioning budget increases to accommodate the transition of these reactors from operations to decommissioning, but the Nuclear Reactor Regulation oversight budget does not decrease consistent with this transition?

ANSWER.

o) The NRC's Principles of Good Regulation include the reliability principle, which states: "Regulatory actions should always be fully consistent with written regulations and should be promptly, fairly, and decisively administered so as to lend stability to the nuclear operational and planning processes." This principle mirrors, in part, NRC's authorizing fee legislation, which requires NRC to fairly and equitably allocate its regulatory costs to its licensees.

Consistent with both the reliability principle and applicable law, the costs for the NRC's generic work with respect to regulating the existing fleet of nuclear power operators must be recovered from those operating reactors. Recovering the regulatory costs associated with nuclear power plant operation in this way ensures that the NRC's fees are fairly administered, as those who benefit from the regulatory services pay for them. Were the NRC to shift these costs to other licensees, the result would be contrary to the law and our principles of good regulation.

Dividing the total amount of fee to be recovered by the number of licensees in that fee category ensures fair and stable administration of the NRC's fee policies. The annual fee recovers generic NRC regulatory work, such as rulemaking and research. This work cannot be attributed to a single licensee. The NRC's approach has been sustained by the Federal courts. In addition, the NRC strives to administer regulatory actions in a manner that creates regulatory stability. By simply dividing the amount to be recovered by the number of licensees, the NRC ensures that the existing fleet of power reactors has a general sense of what its annual fees will

be on a year-to-year basis. If the NRC tried to apportion the fees within the power-reactor fee category differently, regulatory stability would not be served as operating reactor licensees reasonably could be subject to wide variations in annual fees, both within the category and from year to year, and the apportionment process could be perceived by the regulatory community as being arbitrary.

The NRC recognizes that its current fee apportionment method will oblige a smaller number of operating reactor licensees to pay higher fees. But, given the requirements of the law, identifying the total amount of generic work that benefits a category of licensees and then dividing that number by the total number of licensees complies with the law and ensures consistency with the NRC's Principles of Good Regulation.

p) As a general matter, state regulatory agencies and plant owners ultimately decide questions of plant operation and commercial feasibility based on factors within the state's jurisdiction (in the case of a regulated utility) or within the purview of the plant owners, including the long-term investment objectives of the licensee. As an independent safety regulator, the NRC has no role in energy planning decisions. The NRC, however, is obliged to assess fees as described above.

Absent unforeseen events, if there is a continuing reduction in the number of operating power reactors, the size of the NRC may be reduced and fees reasonably would be expected to decrease.

q) As noted above, the NRC is an independent safety regulator and has no role in the promotion of nuclear power. As such, the NRC is not in a position to assess the long-term commercial viability of nuclear power plants. If there are substantially fewer operating power reactors in the future, there may be substantial reductions to the NRC's budget.

r) The NRC allocates resources by program business line and not by office; decommissioning activities are encompassed by the Decommissioning and Low-Level Waste Business Line, and the oversight activities of existing nuclear reactors are encompassed by the Operating Reactors Business Line. The agency's FY 2016 Decommissioning and Low-Level Waste Business Line is requesting $44.1 million, including 157.7 FTE. This funding level represents an increase of $4.7 million and 13.4 FTE when compared with the FY 2015 President's Budget. The increase is due, in part, to support licensing and decommissioning oversight activities for the power reactors, including Kewaunee Power Station (Kewaunee), San Onofre Nuclear Generating Station, Units 2 and 3 (SONGS 2 and 3), and Crystal River 3 Nuclear Power Plant (Crystal River 3), that are transitioning from the Operating Reactors Business Line to the Decommissioning and Low-Level Waste Business Line.

The FY 2016 budget for the Reactor Oversight Product Line is requesting $160.7 million, including 805.2 FTE, for oversight activities. This funding level represents an increase of $6.1 million, and a decrease of 13.2 FTE, when compared with the FY 2015 President's Budget. Resources increase in the Oversight Product Line to support Watts Bar 2 transitioning from the New Reactors Business Line to the Operating Reactors Business Line; increases to support security inspection oversight and maintenance; and to maintain the Reactor Program System (RPS) workload management system until the replacement RPS is fully implemented. These resource increases under the Oversight Product Line are partially offset by decreases to license renewal inspections, and to Kewaunee, Crystal River 3, and SONGS 2 and 3 transitioning from the Operating Reactors Business Line to the Decommissioning and Low-Level Waste Business Line.

The Honorable James Inhofe

QUESTION 17. **Are the NRC's budget development process and the fee recovery rulemaking process too slow and cumbersome to reflect real world changes and the timing of appropriations? If so, is the NRC considering development of a legislative proposal to improve the current situation?**

ANSWER.

The fee rulemaking process by design is a methodical and deliberate process that aims to reflect real world changes and timing of appropriations to the extent practicable while ensuring stakeholders have the opportunity to comment on both the proposed and final rule. NRC is not exploring a legislative proposal, but the NRC has developed some strategies where work processes can improve transparency and simplify how the agency calculates and accounts for fees, and improve the timeliness of when fee changes are communicated.

The Honorable James Inhofe

QUESTION 18. **The proposed fee recovery rule for FY 2015 describes the calculation of the hourly rate used to determine Part 170 fees. This includes an estimate for FTE utilization which can be viewed as a measure of FTE productivity. The estimate for FY 2015 is only 1,420 hours out of a standard work year of 2,080 hours. Assuming federal holidays and the maximum time for annual and sick leave, that leaves a gap of 244 hours.**

a) NRC staff has indicated this is largely due to training and travel time. Please provide a detailed breakdown of how those non-productive hours are accounted for (e.g. travel, training, and conferences).
b) According to the proposed fee recovery rule, the NRC only reviews this calculation every two years by examining time and labor data records for employees. Does the NRC monitor and/or manage FTE utilization outside of the fee rule calculation?
c) Is there a goal for FTE productivity? If not, why not?
d) If so, please provide a description of the goal and data on NRC's performance for the last 10 years.
e) If this lost productivity was minimized, please describe the extent to which those resources could improve the timeliness of licensing action reviews and reduce the current backlog.

ANSWER.

a) The analysis of time and labor data from FY 2014 yields a consistent estimate of 1,420 hours for the average number of direct hours that a technical staff member spends performing activities directly associated with the programmatic mission of the NRC. Time spent on mission-related travel is considered programmatic activity and is included in the estimate of 1,420 direct hours. On average, 660 hours of the 2,080 hours in the work year are charged to leave or to indirect time categories. The average distribution of FY 2014 hours by category is provided below.

Time Category	Average Hours	Percent of Total Hours
Annual Leave	176	8%
Federal Holidays	80	4%
Sick Leave	62	3%
Excused Absence	77	4%
Credit Hours Used/Compensatory Time Used *	74	4%

Other Leave	5	0%
Total Leave	**474**	**23%**
Training Attendance	99	5%
General Administration	87	4%
Total Indirect	**186**	**9%**
Total Leave and Indirect	**660**	**32%**
Direct	**1420**	**68%**
Grand Total	**2080**	**100%**

* Does not include compensatory time and credit hours earned.

Notes on Time Categories:

Annual Leave: NRC employees earn annual leave at a rate determined by their years of Federal service. Full-time employees with less than three years of service earn 104 hours per year. Employees with three, but less than 15 years of service, earn 160 hours per year. Employees with 15 or more years of service earn 208 hours per year.

Federal Holidays. Represents an eight-hour day for 10 Federal holidays.

Sick Leave. This category includes standard sick leave and related types of leave such as family-friendly sick leave and for sick leave for serious health conditions.

Excused Absence. This category covers management-approved time away from official duties without charge to leave, such as office closings resulting from severe weather. The FY 2014 hours in this category include time charged during the October 2013 government-wide shutdown.

Credit Hours Used. Credit hours are hours that employees elect to work, with supervisory approval, in excess of their basic work requirement under a flexible work schedule. Credit hours earned are then used in lieu of leave in future pay periods. Because credit hours are earned outside the normal work year of 2080 hours, the direct hours charged by employees working credit hours are not included in the productivity assumption.

Compensatory Time Used. Compensatory time earned is an alternative form of payment for overtime work. The compensatory time earned is used in lieu of leave in future pay periods. Because compensatory time earned is outside the normal work year of 2080 hours, the direct hours charged by employees working compensatory time are not included in the productivity assumption.

Other Leave. Includes time charged to miscellaneous leave categories such as military leave and court leave.

Training Attendance. Includes staff time for all types of training, including online training, classroom training, and conferences attended for training purposes.

General Administration. This includes time spent performing activities not directly attributable to any technical work, such as organizations and office moves; drug testing; Emergency Evacuation, Assembly and Accountability Exercises; Combined Federal Campaign participation; Equal Employment Opportunity activities; and labor partnership activities. It also includes time attending meetings not directly attributable to any technical work, e.g., all-hands meetings and awards ceremonies. It also includes miscellaneous time charges, such as for attendance at the NRC's annual Regulatory Information Conference and participation in focus groups.

b) Yes. The NRC monitors and manages FTE utilization, on a pay period basis and in monthly and quarterly reports. Utilization and FTE projections are updated regularly to ensure resources are expended appropriately and projected to be within appropriated levels and current allocations. The NRC leadership team also reviews FTE utilization data in the context of quarterly performance reviews to ensure that FTE resources are efficiently allocated to achieve mission priorities for the current fiscal year.

c) The NRC does not currently have an FTE productivity goal or a plan to establish one. The productivity assumption used in fee rule calculations represents an average across technical staff in multiple programs with different training and certification demands. Moreover, the data include time charged by employees who, as individuals, vary greatly with respect to their professional experience, technical expertise, and time with the agency. Given the multiple program and human capital variables, a productivity goal based on agency, program, or organization averages would not provide a useful basis for improving efficiency in the execution of agency programs.

d) See answer to c) above.

e) The NRC is committed to improving productivity and to maximizing use of existing resources to improve the timeliness of licensing action reviews and reduce the current backlog. The Project Aim 2020 report identified key strategies and recommendations to transform the agency over the next five years to improve the NRC's effectiveness, efficiency, and agility. The report includes recommendations to streamline agency processes to use resources more wisely, improve timeliness in regulatory decision making, and respond more quickly to changing conditions. In a Staff Requirements Memorandum (SRM) issued June 8, 2015, the Commission accepted many of the recommendations in the staff's Project Aim 2020 report. Specifically, the Project Aim report recommended 17 strategies related to planning, processes and the workforce to "re-baseline" the agency and prepare it for the future.

The Honorable James Inhofe

QUESTION 19. The NRC began assessing the cumulative impacts of its regulations in 2009. And yet, according to the 2014 Unified Agenda for Federal Regulatory Actions, the NRC reported that it had 60 new regulations under development: 3 are "Economically Significant;" 11 represent "Other Significant Agency Priorities;" 45 are "Substantive, Non-significant Rulemaking Activities;" and one is an administrative rulemaking activity.

a. How much is the NRC spending on the 11 "Other Significant Agency Priorities?
b. How much is the NRC spending on the 45 "Substantive, Non-significant Rulemaking Activities"?
c. Can the NRC staff embark on developing the technical basis for a future rulemaking, a resource-intensive process, without prior Commission approval?
d. Please describe the circumstances under which the staff may initiate a rulemaking effort and the circumstances under which the staff must seek prior Commission approval.
e. Shouldn't the staff have to obtain Commission approval on the need for a future rule and its priority before expending significant resources?
f. Rulemaking is a multi-year, resource-intensive effort. Are the costs associated with rulemaking development recovered from licensees regardless of whether a rulemaking is completed?
g. Please provide a breakdown of all active or planned rulemaking activities in FY 2015 and FY 2016, by priority, which ones were staff-initiated, whether they are funded or not, and how much has been spent on each rulemaking to date with a description of any significant cost contributors, including but not limited to research, licensing, and corporate support.
h. The issuance of new rules is a major contributor to cumulative impacts of regulation. GAO reports 15-98 found that NRC's cost estimating procedures "...do not adequately support the creation of reliable cost estimates." This perspective was also reflected in the results of a pilot program the Commission requested the staff undertake with licensee volunteers to examine actual compliance costs compared to NRC's estimated costs. Furthermore, Project Aim 2020 highlighted process inefficiencies and the lack of a common prioritization regime. In light of the current budgetary climate facing the NRC and the economic headwinds facing the industry, please describe why the 2006 revision to Management Directive 6.3 to forgo submittal of rulemaking plans to the Commission, and compulsory review of proposed rules by the Advisory Committee on Reactor Safeguards and the Committee to Review Generic Requirements continues to be prudent course of action.

i. Please provide a copy of the most recent rulemaking plan submitted to the Commission in accordance with NUREG-0053 prior to the 2006 revision of Management Directive 6.3.

ANSWER.

a) Three of these rulemaking activities were also reported as complete; therefore, the NRC is no longer spending rulemaking resources on them. Three additional rulemaking activities reported as "Other Significant Agency Priorities" are currently unfunded.

Only five of the rulemaking activities reported as "Other Significant Agency Priorities" are funded in fiscal year 2015. The NRC plans to spend 10.1 FTE and $425,000 on these five rulemaking activities in fiscal year 2015.

b) Four of these rulemaking activities were also reported as complete; therefore, the NRC is no longer spending resources on them. One additional rulemaking activity has been completed and 18 additional rulemaking activities are currently unfunded in this category.

Only 22 of the rulemaking activities reported as "Substantive, Non-significant Rulemaking Activities" are funded in fiscal year 2015. The NRC plans to spend 44.9 FTE and $1,668,000 on these 22 rulemaking activities in fiscal year 2015.

c) No. The NRC staff will not expend resources developing a technical basis unless the Commission approves work on the rulemaking activity either through the agency's budgeting process or a Staff Requirements Memorandum issued on the Commission's initiative or issued in response to a staff-generated Commission paper that requests Commission direction to begin work.

It is important to note that, if the technical basis does not support rulemaking as the best option to resolve the regulatory issue, the rulemaking activity will be terminated.

d) The NRC staff must receive Commission approval prior to expending resources on a technical basis for rulemaking. Commission approval to commence work on a rulemaking activity is given either through the agency's budgeting process or through a Staff Requirements Memorandum issued on the Commission's initiative or issued in response to a staff-generated Commission paper that requests Commission direction to begin work.

All potential rulemaking activities are prioritized amongst the other agency rulemaking activities. If the rulemaking activity is prioritized as a high priority, then it will be provided to the Commission through the agency's budgeting process. At this time, the Commission will either approve or disapprove the priority assigned to the rulemaking activity and the request that resources be assigned to the rulemaking activity.

If the rulemaking activity is prioritized as a medium or low priority but the staff believes the rulemaking activity needs to be acted on, then the staff will submit a Commission paper that describes the rulemaking activity and requests approval to commence work on the rulemaking activity. In response to the Commission paper, the Commission will either approve or disapprove the staff's request to work on the rulemaking activity. The Commission's decision will be documented in a Staff Requirements Memorandum.

e) Yes, the NRC staff must receive Commission approval prior to expending resources on a technical basis for rulemaking either through the agency's budgeting process or a staff-generated Commission paper that requests approval.

f) Yes, the budgeted amounts associated with rulemakings in a fiscal year must be recovered through 10 CFR Part 171 annual fees.

g) In the table below, staff resources per rulemaking are derived from budget formulation data.

There are 45 active or planned rulemaking activities in FY 2015 and FY 2016. Thirty-one of these activities appear in the Unified Agenda. The prioritization breakdown of all active and planned rulemaking activities is as follows:

- 25 High-Priority Rules
- 19 Medium-Priority Rules
- 1 Low-Priority Rule

In FY 2015 and FY 2016 there are 19 funded active or planned medium-priority rulemaking activities.

- 2 industry-requested and Commission-approved rulemaking activities
- 1 involves a petition for rulemaking
- 4 non-discretionary rulemaking activities
- 2 corporate support rulemaking activities
- 9 staff-initiated, Commission-approved rulemaking activities
- 1 staff-initiated rulemaking activity for which the staff will seek Commission approval

Low-Priority Rulemaking Activities
The NRC does not include any low-priority rulemaking activities in its budget request unless they are non-discretionary rulemaking activities required by Congressional or Executive mandate or by international treaty. When a low-priority rulemaking activity requires agency action, the staff requests Commission approval to commence work. The Commission's decision will be documented in a Staff Requirements Memorandum.

In FY 2015 and FY 2016 there is 1 unfunded low-priority rulemaking activity. This activity, required by statute, is considered non-discretionary.

TABLE 1: Active and Planned Rulemaking Activities

Current Name	Priority	Source	Status (Funded or Unfunded)	Total Budgeted Resources (FY2012 thru FY2015) - Full Time Equivalents (FTE) and Contract Support Dollars
Medical Use of Byproduct Material—Medical Event Definitions, Training and Experience, and Clarifying Amendments	High	Commission-initiated	Funded	10.3 FTE $0
Low-Level Radioactive Waste Disposal	High	Commission-initiated	Funded	11 FTE $526,000
Containment Protection and Release Reduction for Mark I and Mark II Boiling Water Reactors	High	Commission-initiated	Funded	8.8 FTE $409,000
Physical Protection for Category I, II, and III Special Nuclear Material	High	Commission-initiated	Funded	9.15 FTE $123,000
Mitigation Strategies for Beyond Design Basis Events (Formerly Station Blackout rule)	High	Commission-initiated	Funded	13.3 FTE $465,000
Regulatory Improvements for Power Reactors Transitioning to Decommissioning	High	Commission-initiated	Unfunded	New rule, no budget through FY15
Part 26 - Fitness for Duty - Security Force Fatigue at Nuclear Facilities	High	Commission-initiated	Funded	3.5 FTE $0

Current Name	Priority	Source	Status (Funded or Unfunded)	Total Budgeted Resources (FY2012 thru FY2015) - Full Time Equivalents (FTE) and Contract Support Dollars
American Society of Mechanical Engineers 2009-2013 Code Edition and Addenda Incorporation by Reference	High	Commission-initiated / Non-discretionary	Funded	8.1 FTE $0
Enhanced Weapons, Firearms Background Checks, and Security Event Notifications	High	Commission-initiated / Non-discretionary	Funded	3.9 FTE $0
Incorporation by Reference of Revisions of ASME Regulatory Guides (RG 1.84, Rev 37, and RG 1.147, Rev 18, and 1.192, Rev. 2)	High	Commission-initiated / Non-discretionary	Funded	4.5 FTE $0
Part 50.55a - IBR of 2014 Edition ASME Operations and Maintenance Code	High	Commission-initiated / Non-discretionary	Funded	1.5 FTE $0
Part 50.55a - IBR of 2015 Edition ASME Boiler & Pressure Vessel Code	High	Commission-initiated / Non-discretionary	Funded	1.7 FTE $0

Current Name	Priority	Source	Status (Funded or Unfunded)	Total Budgeted Resources (FY2012 thru FY2015) - Full Time Equivalents (FTE) and Contract Support Dollars
Part 50.55a - IBR of Code Case Regulatory Guides - RG 1.84, Revision 38; RG 1.147, Revision 19; and RG 1.192, Revision 3	High	Commission-initiated / Non-discretionary	Funded	1.6 FTE $0
Risk-Informed Changes to Loss-of-Coolant Accident Technical Requirements	High	Commission-initiated / Petition for Rulemaking	Funded	3.5 FTE $0
Amendments to List of Approved Spent Fuel Storage Cask (1) [This is a placeholder for an annual recurring rule. The NRC publishes a varying number of these rules each year.]	High	Industry-requested	Funded	6.4 FTE $0
Incorporate by Reference IEEE 603-2009, Standard Criteria for Safety Systems for Nuclear Power Generating Stations	High	Non-discretionary	Funded	6 FTE $0
Revision of Fee Schedules: Fee Recovery for FY 2016	High	Non-discretionary	Funded	New rule published every year 9.45 FTE $0
Fitness-for-Duty (Health and Human Services (HHS) Requirements)	High	Staff-initiated	Funded	2.3 FTE $150,000

Current Name	Priority	Source	Status (Funded or Unfunded)	Total Budgeted Resources (FY2012 thru FY2015) - Full Time Equivalents (FTE) and Contract Support Dollars
Independent Spent Fuel Storage Installation Security Requirements for Radiological Sabotage	High	Staff-initiated	Funded	8.2 FTE $3,158,000
Clarifying Requirements in Part 21, Reporting of Defects and Noncompliance	High	Staff-initiated	Funded	11.45 FTE $320,000
Drug and Alcohol Testing; Technical Issues and Editorial Changes	High	Staff-initiated	Funded	6.5 FTE $0
Enhanced Weapons - - Section 161A authority	High	Staff-initiated	Funded	2.8 FTE $0
Defense against Common Mode Failures in Digital I&C Systems	High	Staff-initiated	Unfunded	New rule, no budget through FY15
Cyber Security for Fuel Facilities	High	Staff-initiated	Funded	4.7 FTE $666,000
Performance-Based Emergency Core Cooling System Acceptance Criteria	High	Staff-initiated / Petition for Rulemaking	Funded	20.9 FTE $2,091,000
Miscellaneous Administrative Rulemaking (placeholder)	Medium	Staff-initiated	Funded	New rule published every year 1 FTE $0
Miscellaneous Technical Correction (Placeholder)	Medium	Staff-initiated	Funded	New rule published every year 1 FTE $0

Current Name	Priority	Source	Status (Funded or Unfunded)	Total Budgeted Resources (FY2012 thru FY2015) - Full Time Equivalents (FTE) and Contract Support Dollars
Revisions to Reactor Vessel Material Surveillance Program Requirements	Medium	Industry-requested	Funded	1.7 FTE $0
Financial Qualifications for Reactor Licensing	Medium	Industry-requested	Funded	2.4 FTE $0
U.S. Nuclear Regulatory Commission Acquisition Regulation (NRCAR) – 48 CFR Chap. 21	Medium	Non-discretionary	Funded	0.5 FTE $0
10 CFR Part 110, Export and Import of Nuclear Equipment and Material; Updates and Clarifications	Medium	Non-discretionary	Unfunded	New rule, no budget through FY15
Adjustment of Civil Penalties for Inflation (Parts 2 and 13)	Medium	Non-discretionary	Unfunded	New rule, no budget through FY15
Part 71, Compatibility with IAEA Transportation Standards, SSR-6, 2012 Edition	Medium	Non-discretionary	Funded	6.1 FTE $0
Polymer (Polycarbonate or Polyester) Track Etched (PCTE) Membranes	Medium	Petition for Rulemaking	Funded	0.8 FTE $0

Current Name	Priority	Source	Status (Funded or Unfunded)	Total Budgeted Resources (FY2012 thru FY2015) - Full Time Equivalents (FTE) and Contract Support Dollars
Groundwater Protection In Situ Leach Uranium Recovery Facilities	Medium	Staff-initiated	Funded	3.65 FTE $720,000
Variable Annual Fee Structure for Small and Medium Sized Reactors	Medium	Staff-initiated	Funded	Minimal Resources Expended (resources spent on this rulemaking is approximately 0.1 FTE)
Amendments to Material Control and Accounting Regulations	Medium	Staff-initiated	Funded	5.8 FTE $0
Non-Power Reactor (NPR) License Renewal	Medium	Staff-initiated	Funded	3.7 FTE $1,280,000
Radiation Protection	Medium	Staff-initiated	Funded	12.2 FTE $406,000
Dose Assessments for Radioactive Effluents	Medium	Staff-initiated	Funded	8.9 FTE $300,000
Spent Fuel Reprocessing	Medium	Staff-initiated	Funded	9.9 FTE $427,000
Part 37 Physical Protection of Byproduct Material Follow-on Rule	Medium	Staff-initiated	Funded	0.8 FTE $0
Risk Management Regulatory Framework	Medium	Staff-initiated	Funded	4.1 FTE $0
Cyber Security for Byproduct Material Licensees	Medium	Staff-initiated, preparing SECY paper	Funded	0 FTE $0
Dodd-Frank Act of 2010 Rulemaking	Low	Non-discretionary	Unfunded	New rule, no budget through FY15

Current Name	Priority	Source	Status (Funded or Unfunded)	Total Budgeted Resources (FY2012 thru FY2015) - Full Time Equivalents (FTE) and Contract Support Dollars
Rulemaking Support Operating Reactors (FY2014-2015 only)	High	Infrastructure/support	Funded	34.6 FTE $1,030,000
Rulemaking Support DLLW (FY2014-2015 only)	High	Infrastructure/support	Funded	0.8 FTE $0
Rulemaking Support Fuel Facilities (FY2014-2015 only)	High	Infrastructure/support	Funded	0.4 FTE $0
Rulemaking Support Materials Users (FY2014-2015 only)	High	Infrastructure/support	Funded	7 FTE $0
Rulemaking Support SFST (FY2014-2015 only)	High	Infrastructure/support	Funded	33.4 FTE $2,773,000
Rulemaking Support New Reactors (FY2014-2015 only)	High	Infrastructure/support	Funded	2 FTE $0

h) Management Directive 6.3, "The Rulemaking Process," implements Commission direction contained in a May 31, 2006, Staff Requirements Memorandum (SRM).[2] In its 2006 SRM, the Commission directed the staff to implement three measures to improve the efficiency and timeliness of the rulemaking process: waiver of rulemaking plans to the Commission, and waiver of review of proposed rules by the Advisory Committee on Reactor Safeguards and by the Committee to Review Generic Requirements. Reinstatement of these rneasures could be expected to result in an increase to the overall time and resources spent to complete a given rulemaking.

Rulemaking Plans

Rulemaking plans are not required by the Administrative Procedure Act. The NRC began using rulemaking plans in 1995 to document staff's definition of the regulatory problem, identify why NRC action was necessary, outline alternatives, and obtain early management consensus on the direction of the rulemaking.

From 2002-2007, the NRC examined its rulemaking process, including the development of rulemaking plans, in order to identify efficiencies and improve the overall process. An internal staff report found that the development of rulemaking plans: (1) added a significant amount of

[2] COMNJD-06-0004/COMEXM-06-0006 – "Streamlining the NRR Rulemaking Process," Agencywide Documents Access Management System (ADAMS) Accession No. ML061510316.

time to the rulemaking process, and (2) did not shorten the time needed to develop proposed rules. In 2013, the NRC Chairman approved the current version of Management Directive (MD) 6.3, "The Rulemaking Process,"[3] that incorporates the Commission's 2006 direction regarding the waiver of rulemaking plans.

The conditional waiver of rulemaking plans does not change staff's obligation to receive Commission approval prior to expending resources on a rulemaking activity. Commission approval to commence work on a rulemaking activity is given either through the agency's budgeting process or through an SRM issued on the Commission's initiative or issued in response to a staff-generated Commission paper that requests Commission direction to begin work. In light of the conditional waiver of rulemaking plans, the NRC's recent enhancements to the rulemaking process to address the cumulative effects of regulation, has allowed the NRC to simultaneously streamline its rulemaking process and communicate more effectively with the public. In addition, early public input, allows the NRC to develop clear and solid technical bases.

Compulsory Review of Proposed Rules by the Advisory Committee on Reactor Safeguards (ACRS) and the Committee to Review Generic Requirements (CRGR)

As discussed above, the Commission's 2006 SRM approved measures to improve the efficiency and timeliness of the rulemaking process. The Commission stated that the staff "may waive review by the Committee to Review Generic Requirements ("CRGR") at the proposed rule stage, and, notwithstanding 10 CFR § 2.809 and the Memorandum of Understanding between the ACRS and the EDO, may waive review by the Advisory Committee on Reactor Safeguards ("ACRS") at the proposed rule stage ...." The 2006 SRM stated that comments from the ACRS could be submitted to the Commission either during the comment period for the proposed rule, or following the close of the public comment period, but prior to issuance of the final rule.

The Commission directed that nothing in the 2006 SRM should be construed as in any way discouraging communication between the staff and the ACRS. The SRM states that "[w]hile the Commission grants the staff permission to waive review by both committees at the proposed rule stage, due consideration should be given to the merits of earlier engagement with one or both committees, if the staff determines that such engagement will result in a more efficient and effective process for a particular rulemaking." Furthermore, the 2006 SRM directs that "when committee reviews are waived, the staffs of both committees should continue to be provided copies of the proposed rules and supporting documentation to keep them informed." The 2006 SRM directs staff to "work out suitable communication arrangements with ACRS" in order to keep the ACRS informed of waivers of ACRS reviews at the proposed rule stage.

In 2013, MD 6.3 was revised to include the Commission's 2006 direction regarding the review of proposed rules by ACRS and CRGR. Reinstatement of the two committee reviews of proposed rules would increase the time and resources required to develop a given rulemaking.

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[3] ADAMS Accession number ML13205A400.
http://www.internal.nrc.gov/policy/directives/catalog/md6.3.pdf#trans

i) The most recent rulemaking plan submitted to the Commission prior to the 2006 revision of Management Directive 6.3 was submitted to the Commission on October 21, 2004 (Attachment 1).

Management Directive 6.3 does not require submission of a rulemaking plan for Commission approval. However, the Management Directive continues to provide instruction to the staff on the use of a rulemaking plan, and the staff continues to submit rulemaking plans to the Commission, when appropriate.

The Honorable James Inhofe

QUESTION 20. **According to the NRC's response to pre-hearing questions, apparently $393 million has been billed for application reviews in the Office of New Reactors resulting in the issuance of only 2 design certifications and 5 reactor licenses. Of the 17 construction and operating (COL) license applications under review at one time, only seven are active. These COL application reviews span 6 to 8 years, with an average of 82 months. Four of the five reactor vendors have suspended their reviews. One reactor vendor suspended its design certification application after spending 6 years and $86 million, and another after spending 7 years and $83 million.**

a. **Does the NRC have a process in place to capture the work that has been done on applications and preserve the knowledge gained so far in case these companies wish to resume in the future?**
b. **If so, who pays for those costs?**
c. **After expending a combined $160 million but not achieving design certification, what benefit do these two design vendors receive for their expenditures?**

ANSWER.

a) Yes. At the time that the NRC receives notification that an applicant wishes to suspend its application review, the NRC engages with the applicant to determine the best method of documenting and preserving the work completed on the application so that the agency could resume its review as smoothly as possible and with minimal start-up cost should the applicant make such a request in the future. The documentation process is unique to each applicant and is dependent upon the state of the review when the suspension decision is made. The goal, in each case, is to ensure that the staff's review is documented such that the review could be reinitiated with minimal start-up cost, should the applicant so request in the future.

b) During the application suspension process, the applicant and the NRC agree in writing on the types and amount of work to be performed to place the application in a suspended status. The NRC provides the cost (staff hours times the effective hourly rate) of suspending the application and the full cost of that effort is charged to that applicant as 10 CFR Part 170 licensing and inspection fees. While the NRC awaits the reinstatement to active status of these suspended applications, staff previously working on these projects will be redirected to other Part 170 billable work that is not a part of the suspended applications.

c) The staff's review of the US EPR and US APWR design certification applications identified and resolved many technical issues. The resolution of these issues is contained in the safety evaluations completed and issued. Each applicant is also aware of the remaining technical issues to be resolved should the applicant choose to resume the review.

The Honorable James Inhofe

QUESTION 21. **For a budget of $602 million for FY2016, the Office of Nuclear Reactor Regulation (NRR) will inspect 99 operating reactors, review 9 license renewal applications, implement post-Fukushima regulatory changes, and review 900 licensing applications. For a budget of $191 million for FY 2016, the new reactors' office will continue its protracted reviews of 10 applications and inspect five reactors under construction. Please describe the reasons for the apparent discrepancy in efficiency.**

ANSWER.

Differences in the total number of licensing actions under review by the new reactor and operating reactor programs are not indicative of less efficiency in new reactor reviews. The resources required for a review of a design certification or combined license are greater than those required for a license renewal and significantly greater than those for routine licensing actions for operating units, both because of the relatively broader scope of new reactor reviews, as well as the fact that new reactor reviews have frequently entailed first-of-a-kind technical or policy considerations. In addition, the number of resident inspectors assigned to each construction site and regional inspectors implementing the construction inspection program are significantly higher than for an operating reactor. This is to facilitate high levels of inspections across multiple engineering disciplines involving diverse and complex work activities. A thorough and robust review of design change requests and inspections of construction activities is important to ensure licensees are constructing the plants in accordance with the license and that quality programs are properly implemented.

The Honorable James Inhofe

QUESTION 22. **Clarity and predictability with regard to the regulatory process is vital to applicants' ability to secure investment and customers. Given the performance of the NRC's Office of New Reactors, please describe the basis for the Commission's confidence that the NRC will be able to review a small reactor application in a transparent, predictable, and cost-effective manner.**

ANSWER.

The staff is taking a variety of actions to ensure a transparent, predictable, and cost-effective review of SMR applications. The Office of New Reactors has evaluated prior licensing reviews in an effort to make improvements in review effectiveness and efficiency going forward and has implemented specific actions based on lessons learned. In addition, the NRC has been engaging the industry early on key technical aspects of the anticipated designs and is addressing a number of generic policy, licensing, and technical issues, including operator staffing, security, emergency planning requirements, and mechanistic source term analyses. The staff is also actively engaging near-term applicants in numerous meetings to understand and address design-specific technical issues prior to submittal. These actions provide the industry, the applicants, and the NRC enhanced clarity on novel design features contained in the applications and facilitate NRC development of design specific review standards for an application. Design specific review standards are new guidance that will both enable applicants to prepare a complete application and also focus the staff's review of the application. All of these efforts will support a more predictable and efficient review when a small modular reactor application is submitted.

The Honorable James Inhofe

QUESTION 23. **The NRC has undertaken review of an application to certify a foreign reactor design for construction, not here in the U.S., but in a foreign country. Clearly, the NRC is the gold standard for nuclear safety worldwide and their stamp of approval would be a huge selling point for any vendor.**

a. **Considering the NRC is taking seven to ten years to review designs planned for construction here in the U.S., shouldn't the NRC get its house in order on domestic applications before freelancing internationally?**
b. **There are several footnotes in the NRC's budget that domestic licensing work is delayed because resources redirected to Fukushima-related work. How does the NRC justify dedicating resources to this foreign application review rather than resolving the domestic backlog in licensing actions?**
c. **If the work load associated with this foreign review fails to materialize, then the NRC will be left with a shortfall in collections of its Part 170 fees. Will the NRC then be forced to compensate by increasing fees on domestic operating reactors?**

ANSWER.

a. Current regulations in 10 CFR Part 52 permit any organization (foreign or domestic) to submit for review and certification a design that must meet U.S. standards and requirements for construction in the United States. Further, the approval of a design certification only applies to activities under or within the jurisdiction of the United States. Any certification (whether issued to a domestic or foreign organization) provides a range of options for U.S. applicants to reference should they choose to pursue a combined license (COL) under Part 52. There is no current NRC policy that requires a design certification applicant to have a customer seeking to construct in the United States; however, when it comes to budget execution, priority for agency resources will be given to design certification applicants who have a U.S. applicant referencing that design.

b. In parallel with the APR-1400 design certification review, the Office of New Reactors has provided staff resources to the Office of Nuclear Reactor Regulation to support the resolution of the licensing backlog for domestic operating reactors.

c. Fees for the review of the APR-1400 design certification application are being billed solely to the applicant.

The Honorable James Inhofe

QUESTION 24. The NRC utilizes Requests for Additional Information across a wide variety of its regulatory actions. There are numerous concerns with this process including: inadequate management scrutiny, requests unnecessary to make regulatory determinations, the number of successive rounds, repetitious requests, etc. This is a problem the NRC has struggled with before. A 1998 article from Inside NRC indicated NRC was developing a stricter policy on RAI's[1]. The article, *"EDO's Sweeping Plan Will 'Require Fundamental Change' at NRC"* indicated the NRC staff expected to "...develop a stricter policy on the staff's use of requests for additional information (RAIs)."

In fact, the NRC testified before the Subcommittee on Clean Air, Wetlands, Private Property, and Nuclear Safety on February 4, 1999, that:

> *"Improving the RAI Process. We have improved discipline in the process for requesting additional information (or RAI's) from licensees for license amendments and other NRC reviews. We have revised internal NRC guidance, trained appropriate NRC staff, held NRC staff and management accountable for the timeliness and quality of reviews, and developed an outline for general distribution that details the qualities looked for in licensee submittals. These efforts should help to reduce the need for, and the burden associated with, RAI's."*

a. Please provide a copy of the policy described above.
b. If the NRC has deviated from the 1999 policy, please describe those deviations and the reasons for them.
c. The NRC appears to undercount the number of RAI's issued. Does the NRC have a system in place to track the number of RAI's issued, verify that they are not duplicative of other/earlier requests, etc.?
d. Has the NRC conducted any reviews on the effective management of RAI's?
e. If the NRC does not conduct routine reviews of RAI management, when does the NRC plan to initiate them?
f) Does the NRC have goals for the timeliness of staff to issue RAI's and review responses?

[1] Inside N.R.C., 14 September 1998; Vol. 20 No. 19, McGraw-Hill, Inc.

ANSWER.

a) The policy in place concerning the RAI process in the 1999 timeframe is contained in Office of Nuclear Reactor Regulation (NRR) Office Letter No. 803, Revision 2, "License Amendment Review Procedures," dated December 21, 1998. This revision of the Office Letter stated, in part, that "[r]evisions were incorporated to ensure staff requests for additional information add value to the license amendment process." Section 4.3 of the Office Letter (Attachment 2) discusses the RAI process.

b) On August 20, 2001, LIC-101, "License Amendment Review Procedures," was initially issued (previously NRR Office Letter 803). LIC-101 changed the NRR Office Letter 803 guidance to, among other things, emphasize that the goal to limit RAIs should not interfere with responsibility to make sound safety decisions.

The current policy concerning the RAI process in NRR is contained in NRR Office Instruction LIC-101, Revision 4, "License Amendment Review Procedures," dated May 25, 2012. Section 4.3 of the Office Instruction (Attachment 3) discusses the RAI process. The majority of the current guidance on the RAI process is the same as the guidance that was in place in 1999, including guidance that the staff should not issue an RAI if it has or can reasonably infer information necessary to make regulatory findings.

The LIC-101 guidance has been updated and supplemented on several occasions to incorporate best practices and lessons learned. The primary areas where the current guidance differs from the 1999 guidance are as follows:

- The current guidance recommends that the NRC staff develop a draft safety evaluation before preparing RAIs, such that any gaps in the safety evaluation would inform the staff's determination of the additional information that is required. This change is considered a process improvement to limit the RAI questions to only those necessary to make a regulatory finding.

- The current guidance states that an RAI should have a clear nexus to a staff regulatory finding. The staff should not use RAIs when information can be inferred from previously docketed correspondence or generally accepted practice and should not use RAIs as an opportunity to force licensees to take actions beyond those that relate directly to the amendment. Peripheral issues that warrant regulatory attention should be addressed under the appropriate program/process under NRC's regulatory framework (e.g., backfit, inspection, generic communication, enforcement, and allegation). These additions remind the NRC staff to use the right process to resolve issues that should not be addressed through RAIs.

- The current guidance includes provisions for preliminary or draft RAIs that can be discussed with the licensee prior to requesting the licensee to formally provide a response and prior to documenting the draft RAI as an official agency record. Consistent with the 1999 guidance that encouraged the staff to discuss a proposed RAI with the applicant, this communication helps to clarify and focus RAI questions on the information needed to make a regulatory finding and to establish a mutually agreed upon due date for the response. This change is considered a process improvement to ensure that the questions are understandable, the regulatory basis for the questions is clear, to determine if the information was previously docketed, and to establish timeliness expectations.

- Additional guidance is provided on the requirements in 10 CFR 2.108, which provides for the denial of an application based on the failure of the applicant to provide a timely RAI response. This change emphasizes the importance of documenting an applicant's agreed RAI response date and is considered a process improvement to ensure appropriate rigor in significant staff decisions.

- Both the 1999 guidance and current LIC-101 guidance state that the staff should make every effort to limit itself to one round of RAIs per NRR technical branch for an amendment, since the timeliness goals are likely to be exceeded if multiple rounds of RAIs are needed. The current LIC-101 guidance incorporates guidance from a memorandum issued by the NRR Office Director to the NRR staff dated November 3, 2000 (available in the NRC's Agencywide Documents Access and Management System (ADAMS) at Accession No. ML003762381), which addressed a concern that some staff may be taking the guidance on "one round of RAIs" as an absolute limit to be implemented without exception. The memorandum reinforced that although it is desirable to obtain the necessary information in one round, additional RAIs may be necessary if an applicant's response is incomplete or identifies new issues and it also noted that the NRC staff should consider other avenues to gather information. Accordingly, the current guidance states:

  "The desire to limit ourselves to one round of RAIs for the purpose of efficiency should not interfere with our primary mission of ensuring that we maintain public health and safety. If necessary to ensure public health and safety, multiple rounds of RAIs are appropriate. Reviewers should work with the PM [Project Manager] and the licensee to determine the best way to resolve questions (e.g., have a meeting, prepare additional round of RAIs, arrange for a site visit, etc)."

Following the establishment of the Office of New Reactors (NRO), Office Instruction NRO-REG-101, "Processing Requests for Additional Information" (ADAMS Accession No. ML14091A802), was developed to provide guidance to the staff on the use of the electronic RAI (eRAI) system deployed by NRO for issuing and tracking RAIs. Similar to LIC-101, this office instruction describes roles and responsibilities for the NRO personnel involved in the RAI process and the workflow process for the development and issuance of RAIs as well as the review of RAI responses and the status of a particular RAI as the review of the application progresses.

c) NRR and NRO have different methods of tracking RAIs. An RAI may contain one or more questions.

Although NRR does not have a formal system in place to track the number of RAIs issued, the assigned facility Project Manager is responsible for consolidating RAIs generated by the NRC technical staff before issuing the RAIs to the applicant. The Project Manager is also responsible for tracking the RAIs for each licensing action. Previous RAIs and responses are available in ADAMS for use by project managers and technical reviewers who formulate RAIs. Thus, Project Managers and technical reviewers have docketed information available to determine whether a duplicative RAI is being proposed.

The eRAI system in NRO stores RAIs as a package of information that is issued to the applicant. As tracked by NRO, a particular RAI may contain one or more questions. The database is searchable and can be manipulated to show all questions asked on a particular topic across all application reviews.

d) Yes, the NRC and the industry formed a task force to evaluate trends in RAIs as documented in a memorandum dated December 22, 2004 (ADAMS Accession No. ML043580007). Details of some of the results of that review are shown in a meeting summary dated November 16, 2005 (ADAMS Accession No. ML053180482).

NRR is currently reviewing and evaluating the existing NRR license amendment process with the goal of reinforcing current expectations and best practices. The initiative is intended, in part, to identify issues that may be causing some reviews not to be completed in a timely manner and to identify opportunities for improvement. The RAI process is within the scope of this review. The group also is assessing the impact on schedules of multi-round RAIs and quality and timeliness issues related to licensee RAI responses.

NRO is applying lessons learned from its previous licensing reviews to enhance new reactor reviews. This enhanced approach will be applied to the review of the APR1400 design certification application, as well as future early site permit and small modular reactor design applications. Specifically, the staff

- is encouraged to raise issues early before the issuance of an RAI;
- should recognize that an RAI may not be the only way to get the information needed to conduct the review;
- should ensure that RAIs are needed to support a regulatory finding;
- should ensure that all RAIs are reviewed by the technical first line supervisor (and by managers for RAIs issued later in the review or that significantly change the scope of the review); and
- will conduct a prompt acceptance review of RAI responses and completion of a detailed technical review within 30 days or provide justification as to why the review of the response cannot be completed in this time frame.

e) See response to question (d) above.

f) The issuance of RAIs is one of the milestones included in the application review schedule. There is no specific agency timeliness goal for issuance of the RAIs alone. The NRR staff has goals for the timely completion of its reviews. Specifically, for most licensing actions (e.g., license amendments and relief requests), the goal is to complete 95 percent of the reviews in less than one year and 100 percent in less than two years (though some highly complex and routine reviews have longer and shorter goals, respectively). When an application is submitted, the project manager develops an initial schedule with the intent of meeting the one-year goal or the licensee need date, which may be sooner than one year. The schedule includes milestones for expected licensee responses to the RAIs. The response timeframe is typically 30 days or another time as agreed to by the applicant and Project Manager such that the overall review schedule is not impacted. The timing of the response is often dependent upon the complexity of the issue and whether the licensee has the requested information readily available.

The goal for NRO staff is to issue RAIs in the earliest phase of the application review, as practicable. RAIs can be issued in later phases of the review but will receive more scrutiny by supervisors and managers. As stated previously, the enhanced approach for new reactor reviews has the staff conducting a prompt acceptance review of the RAI response and a detailed review within 30 days of the response or a justification as to why the review of the response cannot be completed in this time frame.

The Honorable Shelley Moore Capito

QUESTION 1. **For regulatory changes that do not require Commission review, what processes exist to ensure the proposals comport with the Commission's direction on the use of qualitative factors?**

ANSWER.

The Commission's March 4, 2015, direction to the NRC staff on the use of qualitative factors (available in the NRC's Agencywide Documents Access and Management System (ADAMS) at Accession No. ML15063A568) is a Commission policy directive. Under Management Directive 9.17, "Organization and Functions: Office of the Executive Director for Operations," the Executive Director for Operations (EDO) must comply with and implement the policies, regulatory decisions, findings, and determinations of the Commission. Thus, it is the EDO's responsibility to ensure that any regulatory changes that do not require Commission review before staff implementation comply with all Commission policy direction, including the recent direction on qualitative factors. The NRC staff also intends to update Management Directive 6.3, "The Rulemaking Process," to ensure that the Management Directive expressly directs the staff to address qualitative factors consistent with the Commission's direction.

Finally, the Commission's March 4, 2015, direction approved the staff's plans to update the NRC's internal guidance documents on the use of qualitative factors, subject to the Commission's direction on consideration of qualitative factors. These NRC guidance documents include the NRC's "Regulatory Analysis Guidelines," NUREG/BR-0058, and the NRC's "Regulatory Analysis Technical Evaluation Handbook," NUREG/BR-0184. When these documents are updated, they will provide additional assurance that regulatory changes delegated to the NRC staff (and therefore do not require Commission review) also will comply with the Commission's direction on the use of qualitative factors.

The Honorable Deb Fischer

QUESTION 1. **When my colleagues, Chairman Inhofe and Subcommittee Chairman Capito, requested information on Fukushima-related costs, very little information was provided by the NRC for either its own costs or its estimates of the industry's costs. With regard to the industry, you provided estimates for only two Fukushima items.**

a. For each of the NRC's 35 post-Fukushima items, please provide: the status, estimated industry implementation dates, estimated industry implementation costs, NRC's full costs to date, and the full NRC resources budgeted for FY2016.

ANSWER.

Table 1 below provides the status and the fiscal year (FY) 2016 Congressional Budget Justification for the 35 Fukushima lessons-learned items[1] identified in the NRC's Near-Term Task Force (NTTF) report, along with the status of additional lessons-learned items identified by the NRC staff or other stakeholders subsequent to issuance of the NTTF report. Additional information on each of these initiatives is included in SECY-15-0059 (available in the NRC's Agencywide Documents Access and Management System (ADAMS) at Accession No. ML15069A444), which provides the NRC staff's most recent six-month status update on Fukushima lessons-learned activities to the Commission. Table 2 provides a summary of the NRC's costs to date on post-Fukushima safety improvements.

With regard to the industry's costs for implementing the three Tier 1 orders issued by the NRC, these regulatory requirements were generally promulgated to provide reasonable assurance of adequate protection of public health and safety, which is a statutory standard the NRC must meet under Section 182a. of the Atomic Energy Act, 42 U.S.C. § 2232(a). As such, these actions are being pursued without consideration of costs. However, the NRC does work with the industry and other stakeholders to allow for the most cost-efficient and effective implementation of these requirements.

In addition to these orders, the NRC also issued a Tier 1 request for information pursuant to Paragraph 50.54(f) of Title 10 of the *Code of Federal Regulations* (10 CFR). The purpose of this information request was to obtain information from power reactor licensees to determine if additional regulatory action should be taken in response to the accident. The NRC recently completed an analysis of the expected costs associated with these requests for information. This analysis shows that this activity will cost licensee's a total of approximately $500 million, with $300 million already expended.

While the NRC does not have detailed cost information on all the Tier 1 recommendations, the NRC is aware of cost estimates prepared by external sources associated with these initiatives. For example, a representative of the FirstEnergy Nuclear Operating Company, which owns and operates four nuclear power plants in the U.S., briefed the NRC Commission on July 31, 2014, and discussed, in part, the cost of these safety enhancements (the presentation slides can be found at ADAMS Accession No. ML14213A209). At that meeting, FirstEnergy estimated that the company will spend approximately $125 million to implement the new regulatory requirements at its four nuclear power plants. Extrapolating this average cost to all U.S. nuclear

power plants would result in an approximate total industry cost of approximately $3 billion. Separately, Platts[2] estimated that the total industry cost to implement the post-Fukushima regulatory requirements is approximately $3.6 billion. These two external cost estimates do not purport to account for all Fukushima-related actions being taken by the NRC's nuclear power plant licensees.

With respect to the Tier 2 and 3 recommendations, the NRC is on or ahead of established schedules for these activities. In the interest of efficiency and effectiveness, the majority of the Tier 2 recommendations have been subsumed into one of the NRC's Tier 1 rulemaking activities and, as a result, those recommendations will be resolved more expeditiously. In most other cases, the NRC continues to evaluate the need for additional regulatory action for these recommendations and has not yet completed the analyses that would be required under 10 CFR 50.109, "Backfitting," before imposing any new requirements. As part of those analyses, the NRC would first assess whether a proposed backfit is either necessary for adequate protection or needed to ensure compliance with an existing requirement. If neither of these criteria applies, the NRC staff would need to determine whether the new requirement represents a substantial increase in safety and that the costs of the new requirement are justified in light of the safety benefit. Because these evaluations have not yet been completed, the basis for any new requirements, including expected industry costs associated with these activities, is not available at this time. The NRC intends to use existing processes, such as the development of formal backfit analyses, as applicable, and interactions with the NRC's Advisory Committee on Reactor Safeguards, the NRC's Committee to Review Generic Requirements, and the industry, public, and other external stakeholders, to assess these recommendations.

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[2] Article entitled, "Post-Fukushima modifications could cost U.S. nuclear operators $3.6 billion," Nucleonics Week, Platts – McGraw Hill Financial, June 6, 2013.

Table 1: Status of NRC Fukushima Lessons Learned Activities May 2015						
NTTF Rec.	Recommendation	Tier	Status	FY 2016 Budgeted FTE	FY 2016 Budgeted Contract ($K)	FY 2016 Budget Total ($K+FTE)
1.1	Commission Policy Statement on risk-informed defense in depth framework.	N/A	Closed per Commission direction and incorporated into ongoing risk management initiatives.	-	-	-
1.2	Initiate rulemaking consistent with the Commission Policy Statement.					
1.3	Modify Regulatory Analysis Guidelines.					
1.4	Evaluate the insights from the Individual Plant Examination and Individual Plant Examination of External Events efforts.					
2.1	Reevaluate seismic and flooding hazards against current requirements and guidance and update the design basis; take appropriate regulatory action to resolve issues associated with updated site-specific hazards.	1	Seismic and flooding reevaluations in progress. Estimated completion in the 2019/2020 timeframe. Work is ongoing to improve schedules and ensure that mitigating strategies can be implemented under reevaluated hazard conditions by the compliance date.	Seismic: 20	$800	$4,120
				Flooding: 25	$2,200	$6,350
2.2	Periodic confirmation of seismic and flooding hazards.	3	Pending outcome of work on Recommendation 2.1.	-	-	-
2.3	Perform seismic- and flood-protection walkdowns to verify compliance with existing seismic and flooding design bases.	1	Complete.	-	-	-

NTTF Rec.	Recommendation	Tier	Status	FY 2016 Budgeted FTE	FY 2016 Budgeted Contract ($K)	FY 2016 Budget Total ($K+FTE)
3.0	Potential enhancements to the capability to prevent or mitigate seismically induced fires and floods.	1&3	Tier 1 – Feasibility of risk analysis tool to be determined in 2015. Tier 3 – Disposition pending completion of Tier 1 aspect.	1	$300	$466
4.1	Rulemaking to codify requirements for capability to maintain plant safety throughout a prolonged station blackout.	1	In progress. SECY-15-0065, "Proposed Rule: Mitigation of Beyond Design Basis Events," sent to Commission at the end of April 2015 and currently under review.	10	$430	$2,090
4.2	Provide a three-phase approach for mitigating beyond-design-basis external events (Order EA-12-049).	1	In progress. Plants are currently implementing the order, with majority of plants to be in compliance by the end of 2016.	40.5	$1,201	$7,924
5.1	Provide a reliable hardened containment vent system for boiling-water reactors with Mark I and II containments (Order EA-13-109).	1	In progress. Phase 1 (wetwell vent) scheduled for completion by mid-2018 and Phase 2 (drywell vent) scheduled for completion by mid-2019.	10	-	$1,660
5.2	Reliable hardened vents for other containment designs.	3	In progress using insights gained from Recommendation 5.1.	3	$500	$998
6.0	Hydrogen control and mitigation inside containment or in other buildings.	3	In progress using insights gained from Recommendation 5.1.	1	$500	$666

NTTF Rec.	Recommendation	Tier	Status	FY 2016 Budgeted FTE	FY 2016 Budgeted Contract ($K)	FY 2016 Budget Total ($K+FTE)
7.1	Provide a reliable indication of water level in spent fuel storage pools.	1	In progress. Plants are currently implementing the order, with majority of plants to be in compliance by the end of 2016.	5	-	$830
7.2	Spent fuel pool makeup system enhancements.	2	Subsumed into work on Tier 1 Recommendations 4.1 and 4.2.	-	-	-
7.3	Revise technical specifications for spent fuel pool requirements.					
7.4	Seismically-qualified means to spray water into the spent fuel pools.					
7.5	Initiate rulemaking or licensing activities related to 7.1–7.4.					
8.1	Modify emergency operating procedures technical guidelines.	1	Subsumed into work on Tier 1 Recommendations 4.1 and 4.2.	-	-	-
8.2	Modify standard technical specifications.					
8.3	Order licensees to modify each plant's technical specifications.					
8.4	Training and exercises Severe Accident Management Guidelines and Extensive Damage Mitigation Guidelines.					
9.1	Emergency preparedness enhancements for multiunit events.	3	Subsumed into work on Tier 1 Recommendation 4.1.	-	-	-
9.2	Emergency preparedness enhancements for prolonged station blackout.					

NTTF Rec.	Recommendation	Tier	Status	FY 2016 Budgeted FTE	FY 2016 Budgeted Contract ($K)	FY 2016 Budget Total ($K+FTE)
9.3	Orders to improve off-site emergency preparedness.	1	Being addressed in parallel with work on Tier 1 Recommendations 4.1 and 4.2.	2	$100	$432
9.4	Complete the emergency response data system modernization initiative to ensure multiunit site monitoring capability.	1	Complete.	-	-	-
10.1	Analyze current protective equipment requirements for emergency responders and guidance based upon insights from the accident at Fukushima.	3	Evaluation to start in 2016.	1	-	$166
10.2	Evaluate the command and control structure and the qualifications of decision-makers to ensure that the proper level of authority and oversight exists for a long-term station blackout or multiunit accident or both.					
10.3	Evaluate the capability of emergency response data systems and make improvements as needed.					
11.1	Study whether enhanced onsite emergency response resources are necessary to support the effective implementation of the licensees' emergency plans.	3	Combined with actions on Recommendations 10.1–3.	-	-	-
11.2	Evaluate insights from Fukushima to identify potential enhancements to the U.S. decision-making framework.					

NTTF Rec.	Recommendation	Tier	Status	FY 2016 Budgeted FTE	FY 2016 Budgeted Contract ($K)	FY 2016 Budget Total ($K+FTE)
11.3	Study the efficacy of real-time radiation monitoring onsite and within the emergency planning zones.	3	Combined with actions on Recommendations 10.1–3.	-	-	-
11.4	Training in the local community.					
12.1	Reactor Oversight Process modifications to reflect the recommended defense-in-depth framework.	3	Pending outcome of work on Recommendation 4.2 and other Tier 1 activities.	-	-	-
12.2	NRC staff training on severe accidents and resident inspector training on severe-accident management guidelines.	3	Training seminars for NRC staff have been held and more are planned for 2015 and 2016.	-	$100	$100
Other	Containment Protection and Release Reduction Rulemaking, which addresses filtering strategies and codifies requirements of Order EA-13-109.	1	Proposed rule scheduled to be sent to Commission in 2016.	5	-	$830
Other	Reevaluate other natural external hazards against current requirements and guidance and update the design basis; take appropriate regulatory action to resolve issues associated with updated site-specific hazards.	2	Pending outcome of work on Recommendation 2.1.	-	-	-
Other	Revisit emergency planning zone size.	3	Pending further study.	-	-	-
Other	Pre-stage potassium iodide beyond 10 miles.	3	Pending further study.	-	-	-

NTTF Rec.	Recommendation	Tier	Status	FY 2016 Budgeted FTE	FY 2016 Budgeted Contract ($K)	FY 2016 Budget Total ($K+FTE)
Other	Expedited transfer of spent fuel to dry cask storage.	3	Closed per Commission direction. Requirement to expedite transfer of spent fuel to dry cask storage was found not to be justified.	-	-	-
Other	Reactor and containment instrumentation capable of withstanding beyond-design-basis conditions.	3	In progress. Evaluation of need for regulatory action to be completed by end of 2015.	1	-	$166
			FY 2016 Total	124.5	$6,131	$26,798

Table 2 below represents the total NRC resources executed for both contract support dollars and FTE for Fukushima Tier 1, 2, and 3 activities:

Fiscal Year	Contract Support ($K)		Full Time Equivalents	
	Budgeted	Actuals	Budgeted	Actuals[2]
2012	2,000	2,405	35.3	
2013	6,207	8,584	84.9	
2014	10,325	9,278	99.8	
2015	10,431	3,402[1]	99.3	

[1]Data through May 13, 2015.
[2]Data are not available for post-Fukushima items as it is accurately captured at the aggregated product line level.

The Honorable Deb Fischer

QUESTION 2. **As this Committee noted in recent correspondence to the Commission, the NRC staff originally tried to justify a requirement for boiling water reactors to incorporate filtering vents. After more analysis, the NRC staff concluded in December of 2015 that the filtering requirement provides no substantial safety benefit.**

a) When will the NRC close out this issue?
b) How much has the NRC spent to date to evaluate this issue?

ANSWER.

a) The NRC staff is scheduled to provide the proposed rule on containment protection and release reduction for boiling water reactors with Mark I and Mark II containments to the Commission by September 2016 and the final rule to the Commission by December 2017. As a next step, a draft regulatory basis will be issued for public comment. That draft regulatory basis will describe the results of an analysis that investigated whether boiling water reactors (BWRs) with Mark I and Mark II containments should be required to install filtered vents. The NRC staff is interested in public comment on that conclusion, as well as the other items described in the draft regulatory basis.

The issue will be closed out by June 2019 with the completion of all of the implementation actions from the rulemaking and NRC Order EA-13-109, which requires all licensees with BWRs with Mark I and Mark II containments to upgrade the venting capabilities from the containment to provide reliable, severe accident capable hardened vents, and provide additional protections for severe accident conditions.

b) The table below represents NRC's total budgeted resources for both contract support dollars and FTE for the containment protection and release reduction rulemaking. The FTE utilization data are not available at the level of detail requested for the containment protection and release rulemaking.

Fiscal Year	Contract Support ($K)		Full Time Equivalents	
	Budgeted	Actuals	Budgeted	Actuals
2014	75	392	4.3	
2015	75	17[1]	4.5	

[1] Data through May 13, 2015.

The Honorable Deb Fischer

QUESTION 3. **In April 7, 2016, correspondence to this Committee, the NRC stated:**

> ***"The NRC staff concluded (in SECY-13-0030) that expedited transfer of spent fuel to dry cask storage would provide only a negligible reduction in risk to public health and safety, and this reduction was not justified in light of the costs associated with expedited transfer. Therefore, the staff also recommended to the Commission that no further generic assessments be pursued related to possible regulatory actions to require the expedited transfer of spent fuel to dry cask storage."***

The Commission subsequently approved the staff's recommendation that this activity be closed. As I understand it, the NRC's Office of Research continues work on this issue even after developing a consequence study that concluded that the risk of a radioactive release from a spent fuel pool following an earthquake -- even larger that Fukushima -- was one chance in ten million years or less. Please describe the nature of the research, whether this research was initiated by NRC staff, what the NRC expects to learn from it, what safety benefit this research will yield, the full costs to date of this research, the estimated future costs to bring this research to completion, and the estimated date for completion of this research.

ANSWER.

In COMSECY-13-0030 the staff recommended to the Commission that no further generic assessments be pursued related to possible regulatory actions to require the expedited transfer of spent fuel to dry cask storage. The Commission approved this recommendation in May 2014 (SRM-COMSECY-13-0030; available in the NRC's Agencywide Documents Access and Management System (ADAMS) at Accession No. ML14143A360). The Commission also directed the staff to complete a number of related activities. A brief description of the related activities and the staff's completed action follows:

- Develop an information notice to inform licensees of the potential added safety benefit of adopting a "1 × 8" spent fuel pool loading configuration: Information Notice 2014-14 was issued on November 14, 2014 (ADAMS Accession No. ML14218A493).

- Modify the regulatory analysis to explain why the "1 × 8" configuration was not found to offer a substantial increase in safety: An addendum to Enclosure 1 of COMSECY-13-0030, dated September 22, 2014 (ADAMS Accession No. ML14252A708), completed the required modification to the regulatory analysis.

- Evaluate whether to modify through amendment or errata the existing process for seismic-hazard reevaluation (Phase 1 of 10 CFR 50.54(f)) to eliminate the spent fuel pool evaluation step: NRC staff concluded that an appropriate spent fuel pool seismic evaluation should be conducted for plants that "screen-in" and plants that used the results of their Individual Plant Examination of External Events (IPEEE) analyses to "screen-out" of conducting a seismic risk evaluation (the IPEEE program did not analyze spent fuel pool structures, systems, and components). All other plants that "screen-out" will not conduct a spent fuel pool seismic evaluation.

- Provide an information paper detailing staff's views and considerations about the treatment of limited-term operational vulnerabilities associated with the discharge of spent fuel from cores into pools: SECY-14-0136 dated November 26, 2014, (ADAMS Accession No. ML14297A232), provided this information.

- Provide a technical overview of the operational and safety attributes of spent fuel rack designs used in other countries: NRC Staff response to SRM-M140106A and SRM COMSECY-13-0030, dated August 1, 2014, (ADAMS Accession No. ML14108A244) provides the staff response.

Based on the completion of the Commission-directed items discussed above, the Tier 3 issue on expedited transfer of spent fuel to dry cask storage referenced in your question was closed and no further research was conducted.

The Honorable Kirsten Gillibrand

QUESTION 1. **I continue to be concerned that there is not enough focus on planning for the effect of an evacuation in the shadow evacuation zone.**

There are approximately 17 million people who live within 50 miles of Indian Point, which includes New York City. If you are familiar with the geography of New York, you would know that in the event of an evacuation of New York City, the only options are north or west, which means you would have a large number of people evacuating towards Indian Point.

I continue to believe that the current 10 mile Emergency Planning Zone is much too small to take into account the effect of an event, such as a hurricane, earthquake or terrorist attack, which would potentially trigger a widespread evacuation. For example, after Fukushima, FERC recommended that Americans within a 50-mile radius of the plant evacuate. That sends very mixed messages about preparedness.

- **What steps has the NRC taken to work with FEMA and other government agencies to develop an emergency plan that encompasses the shadow evacuation zone specific to Indian Point?**

ANSWER.

The NRC has regulatory oversight for onsite activities within U.S. commercial nuclear power facilities and onsite emergency planning and preparedness, and coordinates with the Federal Emergency Management Agency (FEMA) with respect to offsite emergency planning and preparedness. FEMA, in turn, coordinates with State, Tribal and local governments, as well as non-governmental organizations (NGO) and other first responders regarding offsite emergency planning and preparedness, for the communities and residents that live in the vicinity around the plant. The NRC and FEMA continue to coordinate and conduct exercises to maintain confidence that U.S. nuclear power plant onsite and offsite emergency preparedness programs will protect public health and safety. The agencies also work with State and local agencies to maintain confidence that they can and will take appropriate protective actions in the event of a nuclear plant incident.

The NRC has conducted independent research into evacuations, including the impact of shadow evacuations on evacuation outcomes. Shadow evacuation, with regard to emergency planning zones (EPZs), is the evacuation of the public from areas outside the designated evacuation area. Shadow evacuation would not impact events occurring within the evacuation area but would likely impact the evacuees at the exit routes from the evacuation areas. The NRC has published two studies -- NUREG/CR-6981, "Assessment of Emergency Response Planning and Implementation for Large Scale Evacuations" and NUREG/CR-6864, "Identification and Analysis of Factors Affecting Emergency Evacuations" -- that provide information on how the public actually responds to life-threatening situations, such as wildfires,

chemical fires, malevolent events, and spills. These studies examined more than 60 large-scale evacuations within the United States since 1998 involving more than 12 million people. The general conclusion reached in these studies is that shadow evacuations have no significant impact on evacuation times for those residents directed to evacuate.

NRC's guidance on evacuation time estimates, including shadow evacuations, was independently reviewed by James Lee Witt and Associates (JLWA) at the request of the State of New York as part of a comprehensive review of emergency preparedness for the Indian Point Energy Center and surrounding counties. JLWA subcontracted with Innovative Emergency Management (IEM) in conducting its review. The resulting report, "Review of Emergency Preparedness at Indian Point and Millstone, Final Report," (Witt Report) issued in 2003, stated that shadow evacuation will be modeled effectively and accurately with the assumptions used by Indian Point Energy Center for the evacuation time estimate study. The Witt report suggested enhancements to evacuation planning, to include a potentially larger segment of shadow evacuees under certain conditions such as a terrorist attack, but did not suggest that the modeling used was inappropriate. Since this report was released, the NRC has enhanced its guidance for evacuation time estimates, including shadow evacuation considerations as part of the overall Emergency Preparedness rule update in 2011. This updated rule requires nuclear power plant licensees to use NRC-approved evacuation time estimates and to make periodic updates consistent with population changes as determined by the decennial census or by the required licensee yearly review of population changes in the EPZ. In 2011, the NRC published NUREG/CR-7002, "Criteria for Development of Evacuation Time Estimate Studies," to provide nuclear power plant licensees with an acceptable methodology by which to develop evacuation time estimates. NUREG/CR-7002 provides specific direction on the consideration of shadow evacuation in the development of evacuation time estimates.

The Honorable Kirsten Gillibrand

QUESTION 2. **I would like to ask a few questions about process for developing a safety assessment. In March 2015 FERC approved the Algonquin Pipeline expansion project. This followed the NRC conclusion that if there were a breach and explosion in the pipeline it would not adversely impact the safe operation of the Indian Point nuclear facility.**

a. I would like to further understand the process for developing the safety assessment. Is there a standard process in place that the NRC used to evaluate the potential risks to Indian Point from the proposed pipeline, and if so, has that process been used in any other circumstances to evaluate the potential risks of energy infrastructure in close proximity to a nuclear reactor?
b. It is my understanding that an independent evaluation was not conducted in conjunction with the NRC and the Energy reports. It is really very surprising that this is not required for potentially high-risk projects. Could you please discuss why this was not necessary?
c. As the pipeline expansion moves forward, does the NRC have a process in place for a continual review of all new information and safety concerns?

ANSWER.

a) Yes, the standard process is for the licensee to conduct a site hazard analysis in accordance with 10 CFR 50.59 for the NRC's review. This process has been used in many other circumstances. The licensee developed and submitted a site hazard analysis to address Algonquin Incremental Market (AIM) Project's natural gas pipeline that would traverse a portion of the owner-controlled property at the Indian Point nuclear facility, in support of its 10 CFR 50.59 submittal to the NRC. The NRC staff conducted an inspection of the proposed pipeline route and performed an independent confirmatory analysis. The staff concluded that the applicant's approach is reasonable and its conclusions are acceptable.

Specifically, NRC requirements state that for the nuclear units in operation, if significant changes to the facility are envisioned, licensees should evaluate and address these changes in accordance with the regulatory requirements of 10 CFR 50.59. Based on this 10 CFR 50.59 evaluation, the licensee may be required to submit the proposed modification to the NRC for approval as part of a license amendment under 10 CFR 50.90.

Entergy Nuclear Operations, Inc., performed a site hazards analysis of the proposed AIM Project pipeline pursuant to 10 CFR 50.59 and concluded that the project poses no additional risks and that prior NRC review and approval was not required. The NRC staff reviewed Entergy's 10 CFR 50.59 evaluation, performed an independent blast analysis, and determined that resultant pressure waves and/or critical heat flux from a pipeline rupture from the proposed AIM Project pipeline would not adversely impact safety-related systems, structures, and components (SSCs) at the Indian Point facility. Accordingly, the NRC staff concluded that the

proposed natural gas pipeline will not pose an increased risk to radiological safety at Indian Point.

The NRC staff used the ALOHA computer code in conducting the blast analysis. ALOHA, which was developed by the Environmental Protection Agency and the National Oceanic and Atmospheric Administration, is designed to model chemical releases. This ALOHA computer code is widely accepted and used by numerous industries, and has been used by the NRC staff during its analysis of pipeline proposals associated with other nuclear power plant license applications and requests for modifications/amendments. Specifically, the NRC staff reviewed several nuclear power plant combined license (COL) applications that addressed natural gas pipelines and Liquefied Natural Gas (LNG) facilities near the proposed nuclear reactor sites (including Calvert Cliffs, Turkey Point, and South Texas Project).

Thus, since (1) the AIM Project pipeline will be routed at a significant distance away from SSCs at the Indian Point site, (2) the licensee's analysis concluded that the proposed pipeline will not adversely impact the current licensing basis of the plant, and (3) the NRC's independent analysis has confirmed that the AIM Project pipeline would not adversely impact SSCs at the Indian Point site if the pipeline is ruptured, the NRC staff has concluded that that the proposed AIM Project natural gas pipeline will not pose an increased risk to radiological safety at Indian Point.

b) The NRC staff performed an independent evaluation in connection with the AIM Project natural gas pipeline. Specifically, the NRC staff performed an independent blast analysis of the pipeline project and concluded that the proposed pipeline will not pose an increased risk to radiological safety at Indian Point. The NRC staff remains confident of these findings.

The NRC staff's role in evaluating pipeline projects is limited to confirming that Entergy performed a site hazards analysis as required by NRC regulations in order to determine whether the pipeline would introduce unacceptable risks to the facility. FERC, not the NRC, has statutory responsibility to approve the proposed pipeline. The staff informed FERC of the licensee's analysis and NRC's inspection results, in support of FERC's Environmental Impact Statement. FERC provided its approval of the proposed pipeline on March 3, 2015, and the NRC has concluded (in accordance with its independent confirmatory analysis) that the proposed AIM Project natural gas pipeline will not pose additional risks to radiological safety at the Indian Point site.

c) Yes, the NRC's regulatory process provides a robust foundation for continual review, ongoing inspections, assessments, evaluations, and (when appropriate) the imposition of new requirements.

The NRC staff continuously reviews and inspects its licensee's ongoing activities (as well as emergent issues) to ensure compliance with NRC safety requirements. The NRC's approach for continuing to ensure plant safety combines a set of comprehensive regulations and an adaptable Reactor Oversight Process, including onsite resident inspectors, that together provide a basis for ongoing assurance that the licensing basis for the design and operation of all nuclear power plants provides an acceptable level of safety.

Thus, as the pipeline expansion moves forward, the NRC staff will provide oversight to ensure that the proposed AIM Project natural gas pipeline will not pose additional risks to radiological safety at the Indian Point site.

The Honorable Kirsten Gillibrand

QUESTION 3. **The NRC is responsible for conducting various kinds of inspections and investigations of licensees to determine whether nuclear plants are operating under safe conditions. I understand that such safety reviews may contain sensitive information that cannot be disclosed without jeopardizing plant security. However, I believe that the public has a very legitimate interest in understanding the processes that the NRC follows to make determinations about the safety of nuclear plants. Is there a process for redacting sensitive security information and making these types of safety reviews and analyses public in a way that provides meaningful information about plant safety?**

ANSWER.

The NRC strives for a culture of transparency and openness with the public, while balancing the protection of the security of nuclear power plants. The NRC proactively releases information to assure the public of the safety of nuclear power plants by making information available through the agency's public website. Decisions about the specific information that may be proactively released are made by technical staff with subject matter expertise, pursuant to U.S. laws, policy guidance provided by the Commission, and consistent with the processes set out in NRC Management Directive 3.4, "Release of Information to the Public." Reports related to inspections, enforcement, and investigations undergo a review as set forth by NRC policy. Information that could reasonably be expected to be useful to a potential adversary is redacted from reports prior to public release. As a matter of day-to-day practice, the NRC makes the majority of information that it receives or sends to its licensees publicly available, except for classified, Safeguards Information, security, Privacy Act, proprietary, and pre-decisional information. General descriptions of a plant, certain site characteristics, engineered safety features, and technical specifications are considered to be uncontrolled information and are proactively made available to the public. This proactive release, coupled with information on the NRC's website about how the NRC regulates its licensees, provides information that can help the public understand how the NRC works to ensure plant safety.

The Honorable Jeff Sessions

QUESTION 1. **According to the NRC's FY 2015 proposed rule on fee recovery, NRC expects to recover $895.5 million in fees to fund 90% of its operating expenses. "Corporate Support" is estimated to total $422 million, which would be 47% of the NRC's fee recovery. In 2005, corporate support costs totaled $157 million.**

a. Does the Commission believe it is appropriate to budget more for corporate support for the Office of Nuclear Reactor Regulation ($211M) than is budgeted for oversight of our nation's reactors ($161M)?
b. Please provide the level of corporate support costs for the Office of Nuclear Regulatory Research.
i. How are the corporate support costs for the Office of Nuclear Regulatory Research accounted for in the budget?
ii. Where within the Congressional Budget Justification are these corporate support costs depicted?
c. How does the Commission plan to reduce corporate support costs?
d. How will the Commission ensure that corporate support costs are actually reduced and not merely reclassified as "mission direct" costs somewhere within the agency?
e. Do you agree that a reduction in corporate support costs would free up additional resources that could be dedicated to completing important licensing work in a more timely fashion, thereby reducing the current backlog for reviewing licensing actions?

ANSWER.

a) The NRC's $211 million corporate support allocation applies to the Operating Reactors Business Line rather than the Office of Nuclear Reactor Regulation. The Operating Reactors Business Line has direct budgeted resources of $390 million in seven product lines, of which the Oversight Product Line comprises only a portion of the total resources.

b) i. The NRC allocates corporate support costs by program business line, based on the number of Full-Time Equivalents in each program business line. The NRC does not allocate corporate support costs by office, including the Office of Nuclear Regulatory Research.

b) ii. The corporate support allocations to each program business line in the resource tables at the beginning of each business line chapter, labeled as "Corporate Support." The Corporate Support allocation for all business lines is reported on page 97, in Appendix II of the FY 2016 Congressional Budget Justification.

c) The NRC is committed to cost-efficient budgeting and the prudent use of resources to achieve the agency's mission objectives. In recent years, the NRC has taken a hard look at overhead resources, reducing both FTE and contract support dollars through streamlining initiatives. Between the fiscal year (FY) 2011 Enacted Budget and the FY 2016 President's Budget, the agency realized a reduction of 219 full-time equivalents (FTE) or $36.4 million in

overhead. Centralization of corporate functions was a primary contributor to the decrease, while other contributors included the merger of the Office of Federal and State Materials and Environmental Management and the Office of Nuclear Material Safety and Safeguards, and a decrease in the Regional office support staff.

In June 2014, the NRC embarked on an effort called Project Aim 2020. The purpose of this project was to identify ways to enhance the NRC's ability to plan and execute the agency's mission more efficiently while adapting in a timely and effective manner to a dynamic environment. In a Staff Requirements Memorandum (SRM) issued June 8, 2015, the Commission accepted many of the recommendations in the staff's Project Aim 2020 report. Specifically, the Project Aim report recommended 17 strategies related to planning, processes and the workforce to "re-baseline" the agency and prepare it for the future.

To assist in the continued streamlining of corporate support functions, in February 2015, the NRC contracted with EY (formerly Ernst and Young) to conduct a review of the agency's overhead functions and to identify ways to reduce costs without affecting the agency's ability to carry out its mission. The EY review, which involved interviews with and benchmarking against peer agencies, confirmed that there is no standard government-wide definition of corporate support, but found that NRC overhead costs are roughly in line with peer agencies with respect to the following standard corporate support cost categories used by the Federal Chief Executive Officers Council: acquisition, financial management, information technology, human capital, and real property. However, because of its mission, the NRC has additional security requirements that contribute to higher costs in this area than peer agencies, particularly with regard to physical and personnel security.

The April 30, 2015, EY report recommends that the NRC take action to further reduce corporate support costs by implementing leading practices that have reduced overhead costs at peer agencies. The EY recommendations include, but are not limited to, centralizing budget execution activities in order to increase efficiency and reduce staffing requirements; continuing an initiative to consolidate data centers to reduce housing costs; streamlining the size and deployment of security staffing at NRC facilities to reduce costs; and conducting a cost-benefit analysis on outsourcing transactional mission support processes to evaluate opportunities for cost reduction through the use of external shared service providers. The EY recommendations will be evaluated by the agency as part of the implementation of Project AIM 2020.

d) The NRC endeavors to present its budget in the most relevant and accurate manner. In line with the recommendation that came out of the recent review of the agency's overhead functions by EY (formerly Ernst & Young), the NRC intends to adjust the current budget structure to align overhead and support functions with best practices of other similarly situated federal agencies. Unlike the NRC, the peer agencies that were reviewed do not categorize office-specific mission support costs as a secondary type of overhead alongside agencywide corporate support. During the FY 2016 and FY 2017 budget formulation processes, the NRC, therefore, is attempting to more appropriately categorize mission indirect resources that have been labeled as overhead in past budget submissions. This includes realigning certain mission-related activities (e.g., international activities) that were categorized as corporate support in recent years, but were historically budgeted in the agency's programmatic business lines. As part of the restructuring of the NRC's budget, the agency also intends to reposition mission indirect resources in the program offices, moving them out of the overhead category and restoring their original alignment to the specific programs supported. These actions will bring NRC's approach to overhead more in line with the practices of peer agencies and will result in a clearer presentation of program and corporate support costs in the agency's budget submissions.

However, the agency's corporate support review will not be limited to budget structure adjustments. As noted above, the NRC will also be evaluating a range of recommendations design to reduce corporate support costs as part of the implementation of Project AIM 2020.
e) No. Reducing corporate support might free up additional FTE in the agency, but the people associated with that FTE would not necessarily have the technical skills required to work on licensing actions. Further, it would not be prudent for the agency to hire a significant amount of new FTE to work on the operating reactor licensing backlog because once the backlog is reduced, and as Fukushima work begins to decline, we would have more people than our future workload projections require.

The NRC is making progress in reducing the backlog towards the goal of returning operating reactor licensing metrics to pre-Fukushima performance. The NRC continues to prioritize all licensing action reviews in accordance with their safety significance and the Commission has allocated the necessary additional resources to the Operating Reactor Licensing Program to support continued progress in completing licensing actions in a timely fashion and to reduce the backlog of operating reactor licensing actions. This activity remains a high priority for the NRC and the Commission will continue to ensure that the necessary resources are allocated to the Operating Reactor Licensing Program to continue progress in completing licensing actions in a timely fashion and reducing the backlog.

Attachment 1 (Question 19)

Proposed Rulemaking Plan

CLARIFICATION OF NRC CIVIL PENALTY AUTHORITY OVER CONTRACTORS AND SUBCONTRACTORS WHO DISCRIMINATE AGAINST EMPLOYEES FOR ENGAGING IN PROTECTED ACTIVITIES (RM #636)

REGULATORY PROBLEM

The NRC's employee protection regulations in 10 CFR 30.7, 40.7, 50.7, 60.9, 61.9, 63.9, 70.7, 72.10, and 76.7 prohibit discrimination by a Commission licensee, applicant for a Commission license, contractor or subcontractor of a Commission licensee or applicant, a holder of or applicant for a certificate of compliance (CoC), or the United States Enrichment Corporation (Corporation) against employees for engaging in certain protected activities. These regulations provide for certain enforcement actions for violation of these requirements. These enforcement actions are denial, revocation, or suspension of the license; imposition of a civil penalty on the licensee or applicant; or other enforcement action.[1] While the enforcement actions specify imposition of a civil penalty on the licensee or applicant, they do not specify imposition of a civil penalty on a contractor or subcontractor. Since the activities of these non-licensees can clearly affect the safe operation of a licensee's facility, it is important that these non-licensees abide by NRC's employee protection regulations. Because prohibition of discrimination against employees for engaging in certain protected activities applies directly to contractors and subcontractors of licensees, NRC should be able to bring the full scope of enforcement actions to bear on contractors and subcontractors who violate its employee protection regulations.[2]

The Commission, in its Staff Requirements Memorandum (SRM) on SECY-97-281, dated January 15, 1998, directed the staff to consider and propose modification to NRC's employee protection regulations to allow imposition of civil penalties on contractors and subcontractors for discriminating against employees who have engaged in protected activities. The staff deferred acting on this matter pending resolution of action in *Thermal Science, Inc., v. NRC* (Case No. 4:96CV02281-CAS), which included an issue concerning the scope of the Commission's civil penalty authority over contractors and subcontractors. That case was subsequently settled.

On April 14, 2000, the Executive Director for Operations chartered a Discrimination Task Group (DTG) to evaluate the NRC's handling of discrimination cases. The DTG's report, "Policy Options and Recommendations for Revising the NRC's Process for Handling Discrimination Issues," was forwarded to the Commission as an attachment to SECY-02-0166, dated September 12, 2002. Among other recommendations, the DTG recommended that rulemaking be initiated to allow the NRC to impose civil penalties on contractors working for NRC licensees.

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[1]10 CFR 76.7 currently does not specify the availability of civil penalties as an enforcement action. As part of this Rulemaking Plan, the staff will amend 10 CFR 76.7 to bring it into conformance with the other employee protection regulations.

[2]As noted in the OGC Analysis section of this Rulemaking Plan, these amendments do not diminish the focus on licensee responsibility to comply with NRC employee protection regulations, e.g., there may be instances in which the NRC may wish to issue civil penalties to both the responsible contractor and licensee for employee protection violations involving both licensee and contractor culpability.

On March 26, 2003, the Commission issued an SRM on SECY-02-0166 approving the recommendations of the DTG as revised by the Senior Management Review Team, subject to certain comments. The Commission approved, without comment, the DTG rulemaking recommendation regarding civil penalties against contractors.

The staff is now initiating this rulemaking in response to the Commission's direction in its SRMs on SECY-97-281 and SECY-02-0166.

EXISTING REGULATORY FRAMEWORK

10 CFR 30.7, 40.7, 50.7, 60.9, 61.9, 63.9, 70.7, 72.10, and 76.7 set out NRC's employee protection requirements.[3] The following provides a brief outline of sections (a) through (f) of 10 CFR 30.7, 40.7, 50.7, 60.9, 61.9, 63.9, 70.7, 72.10, and 76.7. Paragraph (a) prohibits a Commission licensee, applicant, contractor or subcontractor of a licensee or applicant, (72.10 also includes a holder of, or applicant for, a CoC and in 76.7, the Corporation), from discriminating against employees for engaging in protected activities and defines the protected activities. Paragraph (b) explains that employees have a personal remedy for such discrimination through the Department of Labor (DOL). Paragraph (c) states that discrimination may be grounds for denial, revocation, or suspension of the license (72.10 also includes denial, revocation, or suspension of the CoC and 76.7 includes suspension of the certificate), imposition of a civil penalty[4] on the licensee or applicant, or other enforcement action. Paragraph (d) explains that adverse actions may also be legitimately taken by an employer. Paragraph (e) mandates posting of NRC Form 3. Paragraph (f) prohibits agreements affecting the compensation, terms, conditions, or privileges of employment.

These regulations were promulgated by the Commission to implement its authority to assess a civil penalty under Section 234 of the Atomic Energy Act for such violations. However, while paragraph (a) prohibits discrimination by a contractor or subcontractor, paragraph (c) does not explicitly provide for the imposition of a civil penalty on a contractor or subcontractor. In addition, 10 CFR 76.7(c) currently does not specify the availability of civil penalties as an enforcement action. The Supplementary Information that accompanied the promulgation of 10 CFR 76.7 does not indicate that this omission was intentional; in fact, there is an indication that the intent was that the provisions of this section should be the same as the provisions of the other employee protection regulations.

CONCLUSION

The proposed rule change will enhance the regulatory process by allowing the Commission to exercise its authority to impose a significant enforcement action, i.e., civil penalty, directly on contractors or subcontractors who violate the NRC's employee protection regulations.

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[3]10 CFR 19.20 and 150.20 also contain or make reference to employee protection regulations. However, 10 CFR 19.20 and 150.20 will not be amended as part of this proposed rulemaking and are not discussed further in this Rulemaking Plan.

[4]10 CFR 76.7(c) currently does not specify the availability of civil penalties as an enforcement action.

HOW THE PROPOSED RULEMAKING WILL RESOLVE THE REGULATORY PROBLEM

10 CFR 30.7, 40.7, 50.7, 60.9, 61.9, 63.9, 70.7, 72.10, and 76.7 will be amended to provide that, in addition to imposing a civil penalty against a Commission licensee or applicant for a Commission license or a holder of or applicant for a CoC, the Commission may impose a civil penalty against a contractor or subcontractor of any of these entities for discriminating against an employee for engaging in protected activities. In addition,10 CFR 76.7 will be further amended to specify the availability of civil penalties as an enforcement action.

OGC ANALYSIS

The Office of General Counsel (OGC) has reviewed the draft rulemaking plan proposing to amend NRC's employee protection regulations in 10 CFR 30.7, 40.7, 50.7, 60.9, 61.9, 63.9, 70.7, 72.10, and 76.7. The purpose of the rulemaking is to enable the Commission to impose civil penalties upon non-licensee contractors and subcontractors engaged in licensed activities who violate provisions of these regulations. The staff believes that this rulemaking is necessary because, while the employee protection regulations prohibit such discrimination by a Commission licensee, applicant, or contractor or subcontractor of a licensee, paragraph (c)(2) of these regulations provides that a violation of certain sections of these regulations may be grounds for imposition of a civil penalty on the licensee or applicant but does not provide that such a violation may also be grounds for imposition of a civil penalty on a contractor or subcontractor.

After review of the Atomic Energy Act of 1954 as amended (AEA), we conclude that Sections 161 and 234 provide the Commission with sufficient authority to impose civil penalties against non-licensee contractors and subcontractors. Accordingly, there appears to be no statutory impediment to amending the employee protection regulations to incorporate a civil penalty feature against contractors and subcontractors. However, we believe that there is a policy issue that should be considered in amending these regulations. Specifically, the supplementary information should clarify that the amendments do not diminish the focus on licensee responsibility in the investigative and enforcement process. There may be instances in which the Commission may wish to issue civil penalties to both the responsible contractor and the licensee; for example, in cases where there are employee protection violations involving both licensee and contractor culpability or situations in which the licensee is aware of discrimination by its contractor and does not take immediate action to remedy the situation.

The proposed rule will require the preparation of an environmental assessment, as it appears that there are no categorical exclusions in 10 CFR 51.22(c) which would apply to this rulemaking. The proposed rule is not subject to the backfit considerations of 10 CFR 50.109; therefore, a backfit analysis is not required.

The determination of whether the rule is a major rule (having an impact of over $100 million) under the Small Business Regulatory Enforcement Fairness Act of 1996 will be made during the development of the regulatory analysis prepared for the proposed rule. If the rule is not a major rule, then the mandated 60-day period before a major rule becomes effective is not applicable.

The proposed rule contains no information collection requirements and, therefore, is not subject to the requirements of the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et. seq.)

AGREEMENT STATE IMPLEMENTATION ISSUES

Under the "Policy Statement on Adequacy and Compatibility of Agreement State Programs" which became effective on September 3, 1997 (62 FR 46517), NRC program elements (including regulations) are placed into compatibility categories. In addition, NRC program elements also are identified as having particular health and safety (H&S) significance or as being reserved solely to the NRC. Compatibility Category A includes program elements that are basic radiation protection standards or related definitions, signs, labels or terms necessary for a common understanding of radiation protection principles and should be essentially identical to those of NRC. Compatibility Category B includes program elements that have significant direct transboundary implications and should be essentially identical to those of the NRC. Compatibility Category C are those program elements that do not meet the criteria of Category A or B, but the essential objectives of which an Agreement State should adopt to avoid conflict, duplication, gaps, or other conditions that would jeopardize an orderly pattern in the regulation of agreement material on a nationwide basis. An Agreement State should adopt the essential objectives of the Compatibility Category C program elements. Compatibility Category D are those program elements that do not meet any of the criteria of Category A, B, or C, and do not need to be adopted by Agreement States. Category H&S are program elements that are not required for compatibility, but have a particular health and safety role in the regulation of agreement material. The State should adopt program elements in the H&S category in a manner that embodies the essential objectives of the NRC program elements. Compatibility Category NRC are those program elements that address areas of regulation that cannot be relinquished to Agreement States pursuant to the Atomic Energy Act, as amended, or provisions of Title 10 of the Code of Federal Regulations. These program elements should not be adopted by Agreement States.

The proposed rulemaking includes revisions to 10 CFR 50.7, 60.9, 63.9, 72.10, and 76.7. In accordance with the Policy Statement, and its associated implementing procedure, SA-200, "Compatibility Categories and Health and Safety Identification for NRC Regulations and Other Program Elements," 10 CFR Parts 50, 60, 63, 72, and 76 address areas of exclusive NRC authority and are designated a Compatibility Category NRC. These provisions can not be adopted by Agreement States.

In addition, the proposed rulemaking addresses revisions to 10 CFR 30.7, 40.7, 61.9, and 70.7. These provisions are currently designated a Compatibility Category D. Agreement States are not required to adopt these provisions.

MAJOR RULE

The determination of whether this is a major rule (having an impact of over $100 million) under the Small Business Regulatory Enforcement Fairness Act of 1996 will be made during the development of the regulatory analysis prepared for this proposed rule.

SUPPORTING DOCUMENTS

This rulemaking would require a regulatory analysis that would estimate the cost impacts on both the NRC and licensees for changes to NRC's employee protection regulations. The information provided in the regulatory analysis concerning the impact on small entities would be

sufficient to support a regulatory flexibility analysis or certification that the proposed rule would not have a significant economic impact on a substantial number of small entities.

An environmental assessment and finding of no significant impact would be needed to show that the revised requirements would not result in a significant adverse impact to public health and safety and the environment.

The proposed rule is not subject to the backfit considerations of 10 CFR 50.109; therefore, a backfit analysis is not required.

In addition, changes will be necessary to NUREG-1600, "General Statement of Policy and Procedures for NRC Enforcement Actions," the NRC Enforcement Manual, and possibly to NRC Form 3.

RESOURCES

The resources estimated to complete this rulemaking and the associated support and guidance documents are 1.5 full-time equivalent (FTE) positions (1.0 FTE in the Office of Enforcement and 0.5 FTE in other offices) over approximately 2 years. This estimate is based on the rulemaking being completed in FY 2006. OE will accomplish this rulemaking within the existing OE budget by giving it priority over certain other OE work activities.

STAFFING

Staff Level Working Group		Concurring Official
OE:	Doug Starkey (Staff Lead)	Frank Congel
ADM:	Cindy Bladey	Michael Lesar
NMSS:	James Firth	Jack Strosnider
NRR:	Stewart Schneider	James Dyer
OGC:	Susan Chidakel	Stuart Treby
STP:	Cardelia Maupin	Paul Lohaus

STEERING GROUP

This rulemaking will not use a Steering Group.

PUBLIC PARTICIPATION

Rulemaking documents will be placed on the NRC's rulemaking web site to enhance public dialogue. The NRC rulemaking web site allows users to review NRC documents, submit comments on the documents, and review comments and questions submitted by others. The rulemaking plan, the proposed rule and associated guidance documents, and the draft final rule and associated guidance documents would all be placed on NRC's rulemaking web site.

To facilitate Agreement State and non-Agreement State review of the rulemaking plan, the Agreement States will be notified of the availability of the plan on the Technical Conference Forum and all States will be able to review the plan on the NRC's web site. Agreement and non-Agreement State comments will be solicited and considered in the development of the final plan. States will be given 45 days to comment.

The staff also plans to have a public meeting(s) on this rulemaking initiative after receiving Commission direction on this plan.

EDO OR COMMISSION ISSUANCE

The staff believes this rulemaking involves a significant change in policy and therefore recommends that the Commission issue the proposed and final rule.

SCHEDULE

Rulemaking package to the Commission requesting approval of rulemaking plan	October 2004
Proposed rule to the Commission	12 months after approval of rulemaking plan
Public Comment Period	75 days
Public Meetings	During public comment period
Final rule to the Commission	10 months after public comment period closes

Attachment 2 (Question #24)
Excerpt from Office Letter 803, Rev. 2

4.2 Use of Precedent Safety Evaluations

There are a number of considerations and cautions regarding the use of a precedent safety evaluation by NRR staff. These include, but are not limited to, the following:

- ensure that the precedent is appropriate for use with the intended amendment
- ensure that the precedent meets current expectations for format, findings, internal NRR guidance for the item, NRR guidance to industry, and technical content
- ensure that previous plant-specific information is replaced with information relevant to the current plant
- obtain TB concurrence, unless formal guidance has been issued giving an alternative concurrence process

4.3 Requests for Additional Information

The staff is accountable for the appropriateness of RAIs and should ensure that each question in an RAI was developed with proper consideration of the technical complexity, risk significance, existence of precedent amendments, the appropriate scope and depth of the review, and the resource implications for both the staff and the licensee. RAIs should be directly related to the applicable requirements related to the amendment application, and consistent with the applicable codes, standards, regulatory guides, and/or the applicable Standard Review Plan sections. The following guidance is provided for common RAI concerns:

1. Questions included in the formal RAI should ask for information that is required to make the regulatory finding. Each question should explicitly state the regulatory basis for asking the licensee for the information.

2. The staff should not issue any RAIs if the staff has (or can infer with a reasonable degree of confidence) the necessary information to make the regulatory finding. When an RAI is necessary, the staff should make every effort to limit itself to one round of RAIs per TB for an amendment application. The established timeliness goals are likely to be exceeded if multiple RAIs are needed to complete the staff's review of a license amendment application.

3. Frequent and early communications between the PM, TB staff, and the licensee can avoid the need for many RAIs. To ensure an effective and efficient review, PMs are required to notify the licensee prior to issuing an RAI and document the conversation in the RAI cover letter. This notification should include a discussion of the proposed RAI with the licensee.

4. Before developing an RAI, the staff should ensure that the information is not already available to the

staff or that the answer could not reasonably be inferred from general knowledge or existing regulatory requirements.

5. Questions should be specific rather than overly broad, and the response to the RAI should be of value to the staff's safety evaluation basis.

6. If an RAI is issued and the licensee's response does not fully address the RAI, the PM will set up a meeting or conference call with the licensee management to discuss the discrepancy and what needs to be provided to the staff on a timely basis in order to complete the amendment review. Failure of the licensee to provide timely information should result in a denial or withdrawal of the amendment based on a deficiency in the submittal as opposed to a definitive, negative finding by the staff based on the technical merits of the proposed change. The licensee may submit a new application (with the identified discrepancies corrected) at any time in the future.

7. If a disagreement arises with the licensee regarding the appropriateness of an RAI or whether or not the information was provided, the issues should be raised immediately to management for proper resolution.

8. Consistent with Section 4.2, the staff should make use of previous reviews in order to avoid asking unnecessary questions.

9. The timely issuance of an RAI, if necessary, and the licensee's agreed upon time to respond should be factored into the schedule established to complete the review within the licensing action timeliness goals (e.g., FY00 and beyond goals of completing 95% of applications in less than 1 year).

The intent of this guidance is not to limit the staff from getting the information that is needed to perform a technical review; rather, this practice is needed to ensure that the information requests will be productive and focus staff and licensee resources on the pertinent issues necessary to make a regulatory decision.

4.4 Regulatory Commitments

During the review of license amendment applications, the staff will base its findings on a variety of information provided by the licensee. Some information considered important by the reviewer will not be addressed specifically in the affected technical specifications (which would require prior NRC approval of subsequent changes). Those matters considered important to the staff but not requiring the staff's prior approval of subsequent changes have been traditionally referred to as commitments. It is important to consider commitment management in its proper context as an integral part of licensees' and the NRC staff's control of each facility's licensing-basis information. To address identified problems, improve internal processes, and improve its interactions with licensees, the staff plans to define more formally a hierarchy of licensing-basis information and related processes in an NRR office letter (proposed Office Letter 807, "Control of Licensing Basis for Operating Reactors," to be completed by September 1999). The hierarchy relates to the change control and reporting processes associated with

The Honorable Barbara Boxer

QUESTION 1. **On September 10, PG&E submitted a seismic safety report on Diablo Canyon that it was required to prepare under California state law to both the NRC and to the State of California. That report found, among other things that the Shoreline seismic fault was more than twice as long as previously believed. I requested copies of all the press and other materials that the NRC was preparing in advance of this report's release. Those materials indicate that on September 9, PG&E told NRC that it would take 6 more months to answer six seismic safety questions NRC had asked. One of these questions related to whether the information that was in PG&E's new seismic safety report meant that there could be a larger chance that nuclear core damage or a meltdown would occur in the event of an earthquake.**

a. Please provide me copies of 1) all documents related to the preparation of these six questions (including all drafts of these questions, emails, memos, telephone logs, presentations, or other materials) and 2) all documents related to the PG&E responses to these questions (including PG&E's submitted response to these questions, and all emails, memos, telephone logs, presentations or other materials).

b. At the hearing, in response to my questions on the Diablo Canyon safety report, you committed to look into the issues I raised regarding an internal communications plan that was prepared prior to receiving the seismic safety report from PG&E. Can you please tell me whether there is an investigation ongoing related to this issue, who is investigating it, and what is the status of the investigation? Please also describe what information you have learned regarding this incident since you committed at the hearing to "look into it."

ANSWER.

a) Documents responsive to the request are enclosed. There may be some overlap with documents that the NRC has previously provided to the Committee.

b) I have confirmed that this issue related to a draft internal NRC communications plan that address a Diablo Canyon safety report is part of an investigation that is currently pending before the NRC's Office of Inspector General. Questions pertaining to the investigation should be sent directly to the NRC's Office of Inspector General.

The Honorable Barbara Boxer

QUESTION 2

NRC's Inspector General recently released its report on the San Onofre case. The report identified several problems with the way NRC oversees regulations that are intended to demonstrate that when reactor equipment is replaced with similar equipment, it can still meet safety requirements. The IG report also quoted former senior NRC officials who said that the San Onofre steam generator design was fundamentally flawed and would never have been approved if Edison had asked for a license amendment instead of taking a regulatory shortcut.

But NRC's later "lessons learned" report on the San Onofre case made no meaningful recommendations to improve NRC's regulatory processes. In fact, your staff told mine that NRC did not ask the former senior NRC officials who told the Inspector General that Edison should have requested a license amendment instead of taking the regulatory shortcut why they felt that way.

Chairman Burns, both the San Onofre and Diablo Canyon nuclear plants did not comply with NRC's regulations when they replaced their steam generators. Further, former senior NRC officials stated that Edison should have requested a license amendment when it replaced its steam generator. Are you aware of their basis for stating that Edison should have requested a license amendment? Why did you fail to follow up with these key individuals who informed the Inspector General's investigation? Why didn't the personnel who worked on the "lessons learned" report follow up more thoroughly on the Inspector General's work?

ANSWER.

The NRC staff, management, and I have reviewed the Office of the Inspector General (OIG) Event Inquiry report of October 2, 2014, in which former senior NRC officials stated their personal view that Edison should have requested a license amendment. The NRC staff was directed to address the OIG report as part of the SONGS lessons-learned effort. The issues identified by the OIG in its Event Inquiry report, including those associated with NRC oversight of the 10 CFR 50.59 process at San Onofre, were incorporated into the NRC staff's lessons-learned review for appropriate response and actions. The NRC staff's March 6, 2015 lessons-learned report also discussed the staff's consideration of varying perspectives within the NRC regarding the section 50.59 process that the OIG also highlighted in its report. The staff's lessons-learned report identified actions to enhance training on the 10 CFR 50.59 process, including the determination of whether a license amendment is required. As such, although not specifically called out in the lessons-learned report, the NRC staff also considered the perspectives of former senior NRC officials who stated that Edison should have requested a license amendment and these perspectives ultimately were addressed as part of the lessons-learned effort.

The Honorable Shelley Moore Capito

QUESTION 1. **Are you satisfied that the NRC staff is following the Commission's direction on the use of qualitative factors in regulatory changes that are currently under development?**

ANSWER.

I am satisfied that the regulatory analyses that are currently in development under the oversight of the NRC Executive Director for Operations, the cognizant office directors, and staff, will conform with the direction provided by the Commission. The Commission recently approved the staff's plans for updating guidance regarding the use of qualitative factors to improve the clarity, transparency, and consistency of the agency's regulatory and backfit analyses. This approval did not authorize an expansion of the consideration of qualitative factors in regulatory and backfit analyses.

The Honorable Bernard Sanders

QUESTION 1. *States' concerns with existing PSDAR plans*:

On January 27th of this year, the Vermont Attorney General's office sent a letter to you to join the New York and Massachusetts Attorneys General in asking you to investigate the ability of Entergy to pay for decommissioning activities. In this letter, the Attorney General states:

> **"While Vermont Yankee recently disconnected from the electric grid, there are a number of immediate and long term activities that will occur at the plant that could affect the safety of Vermonters. The State of Vermont has a direct interest in the NRC abiding by its statutory duty to ensure that Vermont Yankee's owners and operators have – and continue to have – the ability to pay for these activities....To determine whether Entergy...has adequate financial means without undue or unauthorized reliance on the [Nuclear Decommissioning Trust] Fund, the NRC should fully investigate the financial qualifications of Entergy and its subsidiaries".**

Is it the NRC's duty to ensure that licensees like Entergy are able to finance decommissioning and that involving states in the process would help to ensure that a financially responsible plan is drafted and avoid situations like the one in which Vermonters currently find themselves?

ANSWER.

The NRC has a comprehensive regulatory program in place to provide reasonable assurance that sufficient funding will be available for radiological decommissioning of all U.S. commercial nuclear reactors. To ensure decommissioning funding assurance compliance for a reactor that has permanently ceased operations, the NRC requires the licensee to annually submit financial assurance status reports. These reports include information such as estimated costs to complete radiological decommissioning, past expenditures, available funding, and, if necessary, additional financial assurance to cover any projected shortfalls. This report is similar to the decommissioning funding status reports required during power operations. The NRC monitors decommissioning funding from initial fuel load until license termination.

The States have a very specific role in the decommissioning process. The States are integral in controlling methods of fund collection from ratepayers and establishing site restoration requirements. Concerning decommissioning planning, NRC regulations require that, prior to or within two years following permanent cessation of operations, the licensee submit a post-shutdown decommissioning activities report (PSDAR) to the NRC, with a copy to the affected State(s). The PSDAR must contain, among other things, a description of the planned radiological decommissioning activities, along with a schedule for their accomplishment and a

site-specific radiological decommissioning cost estimate, including the projected cost of managing irradiated fuel. NRC regulations require the staff to notice receipt of the PSDAR in the *Federal Register*, make the document available for public comment, and hold a public meeting in the vicinity of the licensee's facility. Furthermore, the licensee is required to notify the NRC in writing and to send a copy of this notification to the affected State(s) before performing any decommissioning activity inconsistent with, or making any significant schedule change from, those actions and schedules described in the PSDAR, including changes that significantly increase the radiological decommissioning cost.

The Honorable Bernard Sanders

QUESTION 2. ***NRC review and decision-making on decommissioning plans:*** **Do you think that the NRC should have to review post-shutdown decommissioning plans (PSDARs) in a clear, transparent, and consistent way before decommissioning plans are officially accepted? Has the NRC ever rejected a decommissioning plan?**

ANSWER.

NRC regulations require submittal of a post-shutdown decommissioning activities report (PSDAR) to the NRC and the affected State(s) no later than two years after the date of permanent cessation of operations. The purposes of the PSDAR are to: (1) inform the public of the licensee's planned decommissioning activities, (2) assist in the scheduling of NRC resources necessary for the appropriate oversight activities, (3) ensure that the licensee has considered all of the costs of the planned decommissioning activities and has considered the funding for the decommissioning process, and (4) ensure that the environmental impacts of the planned decommissioning activities are bounded by those considered in existing environmental impact statements. The NRC has issued Regulatory Guide 1.185, "Standard Format and Content for Post-Shutdown Decommissioning Activities Reports," to ensure that the information to be submitted in a PSDAR is known to all stakeholders.

In the 1996 rulemaking that established the PSDAR requirements ("Decommissioning of Nuclear Power Reactors," 61 FR 39301; July 29, 1996), the Commission determined that NRC approval of the PSDAR would not be required. The Commission concluded that decommissioning activities could be safely conducted under a licensee's operating license conditions and restrictions. The Commission explained that requiring NRC review and approval of a detailed decommissioning plan would be redundant to the authorization already provided by the NRC for the activities in the facility license. Any proposed actions outside the bounds of the license would require the licensee to request a license amendment, and the licensee would need to appropriately justify why the change was safe. This process has worked efficiently and effectively since it was implemented in 1996 and no identified safety concern has resulted from its implementation.

Although the NRC does not formally approve the PSDAR, the NRC reviews the PSDAR to determine if the information provided by the licensee satisfies the NRC's regulations. The information required to be submitted in a PSDAR includes a description of the decommissioning activities, the schedule for their accomplishment, a discussion of environmental impacts, and a cost estimate. These activities fall within the scope of a licensee's operating license. On occasion, the NRC has requested additional information from a licensee to clarify information in its PSDAR, and these requests are publicly available. Because the information provided by licensees, as supplemented in response to any requests for additional information from the NRC, has satisfied the NRC's PSDAR requirements, the NRC has not rejected a PSDAR.

The NRC's review of the PSDAR culminates in a publicly available acknowledgment letter sent to the licensee documenting the NRC staff's review. The NRC considers its reviews of PSDARs to be clear, transparent, and consistent.

The Honorable Bernard Sanders

QUESTION 3. *The role of states in the decommissioning planning process:* **There are a number of states in which nuclear power plants will be shut down in the coming years. To the people of those states, including California, Vermont and others, the decommissioning process is enormously important because of the obvious impact it will have on them. As you know, when one closes down a nuclear power plant, it means lost jobs. It means lost revenue to the community and lost revenue to the State. Mostly, it is an issue of safety. People want to know what is happening and want the assurance that they will be safe. People want to know – will the process take 60 years or 10 years? Will the company rigorously ensure that the site is free of radioactivity after decommissioning? Where will the nuclear fuel rods be placed? In light of this, do you feel that states and communities affected by the decommissioning of nuclear plants should have a seat at the table when companies like Entergy are drafting their decommissioning plans to make sure that their interests are given due weight during the process?**

ANSWER.

The NRC recognizes the need and desire for community involvement in the decommissioning of a nuclear power plant.

NRC regulations currently offer stakeholders, including States, and members of the community, several opportunities to review and provide comments on licensee documents during the decommissioning process. The States, generally through their public utility commissions, have an additional role in decommissioning planning. For example, the States control the methods used to collect the decommissioning funds from the ratepayers and to establish site restoration requirements.

With respect to the licensees' inclusion of State and affected communities during the development of decommissioning plans, the NRC encourages both the licensees involved in decommissioning activities and the States with interest in these activities to work together and form a community committee to obtain local citizen views and concerns regarding the decommissioning process and spent fuel storage issues. As one example, the State of Vermont formed a Vermont Yankee Nuclear Decommissioning Citizens Advisory Panel. The NRC has supported these meetings by providing presentations to the panel on the decommissioning process.

The Honorable Bernard Sanders

QUESTION 4. *Upholding the accountability of licensees:*

One of the main concerns I have has been highlighted by the Vermont Yankee decommissioning process thus far. Entergy, the licensee, seems to be taking every advantage to use its decommissioning fund to pay for things they shouldn't be using it for, like paying litigation expenses when concerned groups attempt to hold them accountable. This in essence extends the decommissioning process, and is irresponsible – it's a blatant prioritization of the company's bottom line over safety.
What is NRC willing to do to make sure that safe and responsible decommissioning is prioritized over the financial concerns of the licensees?

ANSWER.

The NRC is committed to ensuring that the radiological decommissioning of the site is completed within the time allotted by regulations, and that associated NRC-regulated activities are monitored and ultimately completed in accordance with NRC regulations. To meet this commitment, the NRC has established a comprehensive, regulation-based decommissioning funding program to provide reasonable assurance that sufficient funding will be available for radiological decommissioning of all U.S. commercial nuclear reactors. Specifically, NRC regulations require that, among other things, decommissioning trust funds only be used for legitimate decommissioning activities. Furthermore, regulations require that withdrawals from the fund would not reduce the fund below an amount necessary to maintain the reactor in a safe storage condition in the event of unforeseen conditions or expenses, or inhibit the ability of the licensee to complete funding of any shortfalls in the trust needed to ensure the availability of funds for license termination. Finally, compliance with decommissioning and funding assurance regulations for reactors that have permanently ceased operations is verified by the NRC through a broad monitoring program that includes an onsite inspection program and the requirement that licensees provide annual decommissioning funding status reports.

The Honorable Bernard Sanders

QUESTION 5. **Price-Anderson and the true cost of the nuclear industry: Is it true that because of Price-Anderson legislation, if there were ever a nuclear disaster like Fukushima at any of our nation's 61 operating nuclear power plants or at the 19 that are being decommissioned, the tax-payers of this country could be called upon to come up with an untold amount of money, maybe tens of billions of dollars, to deal with the cost incurred in that disaster?**

ANSWER.

As of June 2015, there are 99 operating commercial nuclear power plants at 61 locations. Under the Price-Anderson Act, Congress established a nuclear insurance regime under which the nuclear industry self-funds approximately $12 billion in public liability protection in the event of a nuclear incident. Large commercial nuclear power reactor licensees are required to carry the maximum level of primary insurance available from private sources (currently $375 million) and are also required to participate in a secondary financial insurance program. Under this program, if a nuclear incident at any participating power reactor results in injury or damage in excess of the primary insurance layer, all power reactor licensees will be charged a retrospective premium up to a specified amount per reactor (currently up to $121.255 million per reactor) per nuclear incident for its pro rata share of the public liability. Thus, the current combined nuclear industry self-insurance under both the primary and secondary layers is approximately $12 billion. This constitutes the current limit of public liability under the Act. If a nuclear incident involves damages to the public that exceed the amount of aggregate liability, Congress has committed under a provision of the Act to "thoroughly review the particular incident and take whatever action is deemed necessary and appropriate to protect the public from the consequences of a disaster of such magnitude."

The Honorable Bernard Sanders

QUESTION 6. **Nuclear Regulatory Commission transparency during rulemaking: Every United States Senator has to cast some very difficult and controversial votes, and even though those votes may be distorted, that's our reality, and we must live with that. Is there any reason why every vote that you cast should not be made public?**

ANSWER.

The Commission does approve the text of final rules in public affirmation sessions as provided by law. The text of proposed and final rules is published in the *Federal Register*. In addition, the Commission routinely makes available to the public documents relevant to the rulemaking process, including the NRC staff's recommendations to the Commission for action on proposed rules, final rules, and rulemaking petitions, as well as the Commission's initial views on the staff's proposal contained in Commissioners' notation votes. These documents are posted on the NRC website upon completion of the voting process (http://www.nrc.gov/reading-rm/doc-collections/commission/cvr/).

Senator INHOFE. Thank you very much, Mr. Chairman.

Ms. Svinicki. Try to keep within our time limit if you would, please.

STATEMENT OF KRISTINE L. SVINICKI, COMMISSIONER, NUCLEAR REGULATORY COMMISSION

Ms. SVINICKI. Thank you, Chairman Inhofe, Ranking Member Boxer and distinguished members of the committee for the opportunity to appear before you today.

The Commission's Chairman, Stephen Burns, in his statement on behalf of the Commission has provided an overview of the agency's budget request as well as a description of some of the key agency accomplishments and challenges in carrying out the NRC's important work of protecting public health and safety and promoting the common defense and security of our Nation.

The NRC continues to implement safety significant lessons learned from the Fukushima accident in accordance with agency processes, while also maintaining our focus on ensuring the safe operation of nuclear facilities and the safe use of nuclear materials.

The current period of implementation of Fukushima-related Tier 1 regulatory actions will require focus from the NRC staff as they review and process an extremely high volume of regulatory submittals and inspect the implementation of these requirements at licensee sites.

At the same time, the agency will be carrying out a set of complex rulemaking activities. In short, demanding work continues before us.

Concurrent with this, the NRC is taking the initiative to improve agency budget formulation, budget implementation and program execution; in other words, an effort to sharpen our delivery of the basics.

This is truly a homegrown initiative involving the efforts and feedback of many hundreds of individual NRC employees who have demonstrated strong ownership of its core elements. These elements are: right-sizing the agency, streamlining agency processes to use resources more wisely, improving timeliness and decision-making and promoting a more unified agency purpose through agencywide priority setting.

We look forward to reflecting progress on these fronts in future budget submittals. I appreciate the opportunity to appear today and look forward to your questions. Thank you.

[Questions for the record and Ms. Svinicki's responses follow:]

Committee on Environment and Public Works
United States Senate
Questions for the Record
April 15, 2015 Oversight Hearing

Senator Capito to Commissioner Kristine L. Svinicki

QUESTION 1.
Are you satisfied that the NRC staff is following the Commission's direction on the use of qualitative factors in regulatory changes that are currently under development?

ANSWER:
The Commission's revised direction to the NRC staff regarding the use of qualitative factors in the development of regulatory analyses was issued relatively recently, in March of 2015. The Commission will need to examine closely those regulatory analyses coming before the Commission for its review and approval, now and in the coming months, for their adherence to the Commission's revised direction.

For example, the revised direction explicitly did not authorize an expansion of the consideration of qualitative factors in regulatory and backfit analyses. Key to interpreting the term "expansion" will be the staff's calibration on what it considers to be currently permissible use of qualitative factors. Consequently, it will be necessary and appropriate for the Commission to review regulatory analyses by the staff, in light of this direction, to discern the staff's understanding and to clarify the Commission's intent (if necessary) through approval or disapproval of proposed regulatory changes.

As stated in my vote on the matter which resulted in the revised direction, "[t]he use of qualitative factors in agency analyses is and should continue to be disciplined, transparently documented, and rare." I continue to hold this view and my votes on future proposed regulatory changes will continue to reflect it.

Senator Sanders to Commissioner Kristine L. Svinicki

QUESTION 1.

States' concerns with existing PSDAR plans:

On January 27th of this year, the Vermont Attorney General's office sent a letter to you to join the New York and Massachusetts Attorneys General in asking you to investigate the ability of Entergy to pay for decommissioning activities. In this letter, the Attorney General states:

> "While Vermont Yankee recently disconnected from the electric grid, there are a number of immediate and long term activities that will occur at the plant that could affect the safety of Vermonters. The State of Vermont has a direct interest in the NRC abiding by its statutory duty to ensure that Vermont Yankee's owners and operators have – and continue to have – the ability to pay for these activities...To determine whether Entergy...has adequate financial means without undue or unauthorized reliance on the [Nuclear Decommissioning Trust] Fund, the NRC should fully investigate the financial qualifications of Entergy and its subsidiaries".

Is it the NRC's duty to ensure that licensees like Entergy are able to finance decommissioning, and that involving states in the process would help to ensure that a financially responsible plan is drafted and avoid situations like the one in which Vermonters currently find themselves?

ANSWER:

The NRC has a comprehensive, regulatory program in place to provide reasonable assurance that sufficient funding will be available for radiological decommissioning of all U.S. commercial nuclear reactors. To ensure decommissioning funding assurance compliance for a reactor that has permanently ceased operations, the NRC requires the licensee to submit financial assurance status reports annually. These reports include information such as estimated costs to complete radiological decommissioning, past expenditures, available funding, and, if necessary, additional financial assurance to cover any projected shortfalls. This report is similar to the decommissioning funding status reports required during power operations.

The States have a specific role in the decommissioning process. The States are integral in controlling methods of fund collection from ratepayers and establishing site restoration requirements. Concerning decommissioning planning, NRC regulations require that prior to or within two years following permanent cessation of operations, the licensee submit a post-shutdown decommissioning activities report (PSDAR) to the NRC, with a copy to the affected State(s). The PSDAR must contain, among other things, a description of the planned radiological decommissioning activities, along with a schedule for their accomplishment and a site-specific radiological decommissioning cost estimate, including the projected cost of managing irradiated fuel. NRC regulations require the staff to notice receipt of the PSDAR in the *Federal Register*, make the document available for public comment, and hold a public meeting in the vicinity of the licensee's facility. Furthermore, the licensee is required to notify the NRC in writing and to send a copy of this notification to the affected State(s) before performing any decommissioning activity inconsistent with, or making any significant schedule change from, those actions and schedules described in the PSDAR, including changes that significantly increase the radiological decommissioning cost.

QUESTION 2.

NRC review and decision-making on decommissioning plans:

Do you think that the NRC should have to review post-shutdown decommissioning plans (PSDARs) in a clear, transparent, and consistent way before decommissioning plans are officially accepted? Has the NRC ever rejected a decommissioning plan?

ANSWER:

NRC regulations require submittal of a post-shutdown decommissioning activities report (PSDAR) to the NRC and the affected State(s) no later than two years after the date of permanent cessation of operations. The purposes of the PSDAR are to: (1) inform the public of the licensee's planned decommissioning activities, (2) assist in the scheduling of NRC resources necessary for the appropriate oversight activities, (3) ensure that the licensee has considered the costs of the planned decommissioning activities and has considered the funding for the decommissioning process, and (4) ensure that the environmental impacts of the planned decommissioning activities are bounded by those considered in existing environmental impact statements. The NRC has issued Regulatory Guide 1.185, "Standard Format and Content for Post-Shutdown Decommissioning Activities Reports," to ensure that the information to be submitted in a PSDAR is known to all stakeholders.

In establishing the PSDAR requirements ("Decommissioning of Nuclear Power Reactors," 61 FR 39301; July 29, 1996), the Commission determined that NRC approval of the PSDAR would not be required and that decommissioning activities would be conducted under a licensee's operating license conditions and restrictions. The Commission concluded that requiring NRC review and approval of a detailed decommissioning plan would be redundant to the authorization already provided by the NRC for the activities in the facility license. Any proposed actions outside the bounds of the license would require the licensee to request a license amendment, and the licensee would need to appropriately justify why the change was safe. Because the activities described in a PSDAR fall within the scope of a licensee's operating license, the information required to be submitted in a PSDAR is limited to a description of the decommissioning activities, the schedule for their accomplishment, a discussion of environmental impacts, and a cost estimate. The NRC's review of the PSDAR culminates with a publicly available acknowledgment letter sent to the licensee documenting the NRC staff's review. The NRC considers its reviews of PSDARs to be clear, transparent, and consistent.

On occasion, the NRC has requested additional information from a licensee to clarify information in its PSDAR and these requests are publicly available. Because the information provided by licensees in their PSDARs, as supplemented in response to requests for information from the NRC, has historically satisfied the PSDAR requirements, the NRC has not rejected a PSDAR to date.

QUESTION 3.

The role of states in the decommissioning planning process:

There are a number of states in which nuclear power plants will be shut down in the coming years. To the people of those states, including California, Vermont and others, the decommissioning process is enormously important because of the obvious impact it will have on them. As you know, when one closes down a nuclear power plant, it means lost jobs. It means lost revenue to the community and lost revenue to the State. Mostly it is an issue of safety. People want to know what is happening and want the assurance that they will be safe. People want to know – will the process take 60 years or 10 years? Will the company rigorously ensure that the site is free of radioactivity after decommissioning? Where will the nuclear fuel rods be placed? In light of this, do you feel that states and communities affected by the decommissioning of nuclear plants should have a seat at the table when companies like Entergy are drafting their decommissioning plans to make sure that their interests are given due weight during the process?

ANSWER:

The NRC regulations currently offer the public several opportunities to review and provide comments on licensee documents during the decommissioning process. Under the NRC regulations in Title 10 of the Code of Federal Regulations (10 CFR) Section 50.82, the NRC is required to publish a notice of the receipt of the licensee's Post-Shutdown Decommissioning Activities Report (PSDAR) and the License Termination Plan (LTP), make the PSDAR and LTP available for public comment, schedule separate meetings in the vicinity of the licensed facility to discuss both the PSDAR and LTP within 60 days of receipt, and publish a notice of the meetings in the *Federal Register*, as well as another forum readily accessible to individuals in the vicinity of the site. The NRC ensures that all members of the public are given a fair and equal opportunity to comment on a licensee's decommissioning and license termination plans. The NRC does not officially recognize or endorse any specific special interest group, public or private organization, community group, coalition, or individual.

The States, through their public utility commissions, have an additional role in decommissioning planning. The States control the methods used to collect the decommissioning funds from the rate payers and for establishing site restoration requirements.

QUESTION 4.

Upholding the accountability of licensees:

One of the main concerns I have has been highlighted by the Vermont Yankee decommissioning process thus far. Entergy, the licensee, seems to be taking every advantage to use its decommissioning fund to pay for things they shouldn't be using it for, like paying litigation expenses when concerned groups attempt to hold them accountable. This in essence extends the decommissioning process, and is irresponsible – it's a blatant prioritization of the company's bottom line over safety. What is NRC willing to do to make sure that safe and responsible decommissioning is prioritized over the financial concerns of the licensees?

ANSWER:

The NRC is committed to ensuring that the radiological decommissioning of the site is completed within the time allotted by regulations, and that associated NRC-regulated activities are monitored and ultimately completed in accordance with NRC regulations. To meet this commitment, the NRC has established a comprehensive, regulation-based decommissioning funding program to provide reasonable assurance that sufficient funding will be available for radiological decommissioning of all U.S. commercial nuclear reactors. The NRC's regulations provide decommissioning funding assurance through several layers of requirements and limitations, which apply from the time of initial licensing through the time of license termination. Specifically, NRC regulations require that, among other things, decommissioning trust funds only be used for legitimate decommissioning activities. Furthermore, regulations require that withdrawals from the fund would not reduce the fund below an amount necessary to maintain the reactor in a safe storage condition in the event of unforeseen conditions or expenses or inhibit the ability of the licensee to complete funding of any shortfalls in the trust needed to ensure the availability of funds for license termination. Compliance with decommissioning and funding assurance regulations for reactors that have permanently ceased operations is verified through a broad monitoring program that includes an onsite inspection program and the requirement that licensees provide annual decommissioning funding status reports.

QUESTION 5.

Price-Anderson and the true cost of the nuclear industry:

Is it true that because of Price-Anderson legislation, if there were ever a nuclear disaster like Fukushima at any of our nation's 61 operating nuclear power plants or at the 19 that are being decommissioned, the tax-payers of this country could be called upon to come up with an untold amount of money, maybe tens of billions of dollars, to deal with the cost incurred in that disaster?

ANSWER:

Under the Price-Anderson Act nuclear insurance framework as established in current law, the nuclear industry self-funds approximately $12 billion in public liability protection in the event of a nuclear incident. Under this statutory framework, large commercial nuclear power reactor licensees are required to carry the maximum level of primary insurance available from private sources (currently $375 million) and are also required to participate in a secondary financial insurance program. If a nuclear incident at any participating power reactor were to result in injury or damage in excess of the primary insurance layer, all power reactor licensees would be charged a retrospective premium up to a specified amount per reactor (currently up to $121.255 million per reactor) per nuclear incident for its pro rata share of the public liability. Thus, the current combined nuclear industry self-insurance under both the primary and secondary layers is approximately $12 billion. This constitutes the current limit of public liability under the Act, and neither the facility licensee nor any other person may be held liable for any claims in excess

of that amount. If a nuclear incident were to involve damages to the public that exceed the amount of aggregate liability, Congress has committed under the Act to "thoroughly review the particular incident and [to] take whatever action is deemed necessary and appropriate to protect the public from the consequences of a disaster of such magnitude."

QUESTION 6.

Nuclear Regulatory Commission transparency during rulemaking:

Every United States Senator has to cast some very difficult and controversial votes, and even though those votes may be distorted, that's our reality, and we must live with that. Is there any reason why every vote that you cast should not be made public?

ANSWER:

The Commission makes publicly available most Commission votes, which may include the Commissioner's detailed explanation of his or her vote. Commissioner votes also often include substantive proposed edits and modifications to the underlying proposal being considered. Accordingly, what generally determines whether a particular Commission Voting Record will be released to the public is whether the underlying proposal addresses matters not suitable for public release. This ensures that sensitive information contained in the Commissioner votes is not inappropriately released to the public. For instance, a proposal being voted upon may involve Classified, Safeguards, Allegation, Investigation, Security-Related, Proprietary, Privacy Act, or Federal/State/Foreign Government and International Agency-Controlled information, or other types of Sensitive Internal Information (which includes adjudicatory, enforcement, budgetary, attorney-client or attorney work product information) not appropriate for public release. In these cases, even where the Commissioner votes do not themselves contain sensitive information, it would typically be necessary to review the underlying proposal in order to understand the vote. Consequently, in these cases, releasing the Commission Voting Record would provide little to no meaningful information for review.

Senator INHOFE. Thank you, Ms. Svinicki.
Commissioner Ostendorff.

STATEMENT OF WILLIAM C. OSTENDORFF, COMMISSIONER, NUCLEAR REGULATORY COMMISSION

Mr. OSTENDORFF. Good morning, Chairman Inhofe, Ranking Member Boxer and distinguished members of the committee.

The Chairman has already provided an overview of the NRC's budget, the changing environment and steps we are taking to improve the operations of the NRC through Project Aim. I am in complete alignment with his testimony.

Looking back over the actions the NRC has taken over the past 4 years as a result of Fukushima lessons learned, I firmly believe that the agency has acted on a foundational basis of solid science and engineering.

We have appropriately given highest priority to the Tier 1 items associated with the greatest safety significance. I am confident in the NRC's safety actions post-Fukushima and believe we have made very substantial progress.

In closing, I appreciate the opportunity to testify today and look forward to your questions.

Thank you.

[Questions for the record and Mr. Ostendorff's responses follow:]

Committee on Environment and Public Works
April 15, 2015
Follow-up Questions for Written Submission
Commissioner William C. Ostendorff

The Honorable Shelley Moore Capito

QUESTION 1. **Are you satisfied that the NRC staff is following the Commission's direction on the use of qualitative factors in regulatory changes that are currently under development?**

ANSWER.

The Commission recently provided direction to the staff for updating guidance on the use of qualitative factors to improve the clarity, transparency, and consistency of the agency's regulatory and backfit analyses. The Commission direction did not authorize an expansion of the consideration of qualitative factors in regulatory and backfit analyses. Specifically, the Commission stated that "the revised guidance should continue to encourage quantifying costs to the extent possible and use qualitative factors to inform decision making, in limited cases, when quantitative analyses are not possible or practical (i.e., due to lack of methodologies or data)." While the staff develops analyses and makes recommendations, the Commission ultimately decides how qualitative factors should be weighed during the course of regulatory decision making. If the Commission determines that the staff needs additional direction in the use of qualitative factors, it will provide it.

Committee on Environment and Public Works
April 15, 2015
Follow-up Questions for Written Submission
Commissioner William C. Ostendorff

The Honorable Bernard Sanders

QUESTION 1. *States' concerns with existing PSDAR plans:*

On January 27th of this year, the Vermont Attorney General's office sent a letter to you to join the New York and Massachusetts Attorneys General in asking you to investigate the ability of Entergy to pay for decommissioning activities. In this letter, the Attorney General states:

"While Vermont Yankee recently disconnected from the electric grid, there are a number of immediate and long term activities that will occur at the plant that could affect the safety of Vermonters. The State of Vermont has a direct interest in the NRC abiding by its statutory duty to ensure that Vermont Yankee's owners and operators have – and continue to have – the ability to pay for these activities....To determine whether Entergy...has adequate financial means without undue or unauthorized reliance on the [Nuclear Decommissioning Trust] Fund, the NRC should fully investigate the financial qualifications of Entergy and its subsidiaries."

Is it the NRC's duty to ensure that licensees like Entergy are able to finance decommissioning and that involving states in the process would help to ensure that a financially responsible plan is drafted and avoid situations like the one in which Vermonters currently find themselves?

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Commissioner William C. Ostendorff

ANSWER.

In order to carry out its statutory duty, the NRC has a comprehensive, regulation-based program in place to provide reasonable assurance that sufficient funding will be available for radiological decommissioning of all U.S. commercial nuclear reactors. To ensure decommissioning funding assurance compliance for a reactor that has permanently ceased operations, the NRC requires the licensee to annually submit financial assurance status reports. These reports include information such as estimated costs to complete radiological decommissioning, past expenditures, available funding, and, if necessary, additional financial assurance to cover any projected shortfalls. This report is similar to the decommissioning funding status reports required during power operations. The NRC essentially monitors decommissioning funding from initial fuel load until license termination.

The States have a specific role in the decommissioning process. The States are integral in controlling methods of fund collection from ratepayers and establishing site-restoration requirements. Concerning decommissioning planning, NRC regulations require that prior to or within two years following permanent cessation of operations, the licensee submit a post-shutdown decommissioning activities report (PSDAR) to the NRC, with a copy to the affected State(s). The PSDAR must contain, among other things, a description of the planned radiological decommissioning activities, along with a schedule for their accomplishment and a site-specific radiological decommissioning cost estimate, including the projected cost of managing irradiated fuel. NRC regulations require the staff to notice receipt of the PSDAR in the *Federal Register*, make the document available for public comment, and hold a public meeting in the vicinity of the licensee's facility. Furthermore, the licensee is required to notify

the NRC in writing and to send a copy of this notification to the affected State(s) before performing any decommissioning activity inconsistent with, or making any significant schedule change from those actions and schedules described in the PSDAR, including changes that significantly increase the radiological decommissioning cost.

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Commissioner William C. Ostendorff

The Honorable Bernard Sanders

QUESTION 2. ***NRC review and decision-making on decommissioning plans:*** **Do you think that the NRC should have to review post-shutdown decommissioning plans (PSDARs) in a clear, transparent, and consistent way before decommissioning plans are officially accepted? Has the NRC ever rejected a decommissioning plan?**

ANSWER.

The NRC considers its reviews of PSDARs to be clear, transparent, and consistent. Clarity is provided by the publicly available review criteria, which outline the information to be submitted in the PSDAR. Transparency is provided by publication of the documents used in the NRC's review and by the 90-day public comment period and the public meeting held in the vicinity of the facility. Consistency is provided by the use of the same criteria and processes for each review.

NRC regulations require submission of a post-shutdown decommissioning activities report (PSDAR) to the NRC and the affected State(s) no later than two years after the date of permanent cessation of operations. The purposes of the PSDAR are to: (1) inform the public of the licensee's planned decommissioning activities, (2) assist in the scheduling of NRC resources necessary for the appropriate oversight activities, (3) ensure that the licensee has considered all of the costs of the planned decommissioning activities and has considered the funding for the decommissioning process, and (4) ensure that the environmental impacts of the planned decommissioning activities are bounded by those considered in existing environmental impact statements. The NRC has issued Regulatory Guide 1.185, "Standard Format and

Content for Post-Shutdown Decommissioning Activities Reports," to ensure that the information to be submitted in a PSDAR is known to all stakeholders.

In the 1996 rulemaking that established the PSDAR requirements ("Decommissioning of Nuclear Power Reactors," 61 FR 39301; July 29, 1996), the Commission determined that NRC approval of the PSDAR would not be required. The Commission concluded that decommissioning activities could be safely conducted under a licensee's operating license conditions and restrictions. The Commission explained that requiring NRC review and approval of a detailed decommissioning plan would be redundant to the authorization already provided by the NRC for the activities in the facility license. Any proposed actions outside the bounds of the license would require the licensee to request a license amendment, and the licensee would need to appropriately justify why the change would be safe. This process has worked efficiently and effectively since implemented in 1996, and the NRC has not identified any safety concerns resulting from the current process.

Although the NRC does not affirmatively approve the PSDAR, the NRC reviews the PSDAR to determine if the information provided by the licensee satisfies the NRC's regulations. Because the activities described in a PSDAR fall within the scope of a licensee's operating license, the information required to be submitted in a PSDAR is limited to a description of the decommissioning activities, the schedule for their accomplishment, a discussion of environmental impacts, and a cost estimate. On occasion, the NRC has requested additional information from a licensee to clarify information in its PSDAR. The requests for additional information are also provided for public information. An example can be seen in the letter, "Crystal River Unit 3 - Request for Additional Information on the Post Shutdown

Decommissioning Activities Report (TAC No. MF3210)," dated April 28, 2014, and available in the NRC's Agencywide Documents Access and Management System (ADAMS) at Accession No. ML14104A039. Because the information provided by licensees in their PSDARs and supplemental responses has satisfied the PSDAR requirements, the NRC has never rejected a PSDAR.

The NRC's review of the PSDAR culminates with a publicly available acknowledgment letter sent to the licensee, which documents the NRC staff's review. (e.g., "Crystal River Unit 3 Nuclear Generating Plant Post-Shutdown Decommissioning Activities Report," dated March 11, 2015; ADAMS ML143212A751).

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Follow-up Questions for Written Submission
Commissioner William C. Ostendorff

The Honorable Bernard Sanders

QUESTION 3. *The role of states in the decommissioning planning process:*

There are a number of states in which nuclear power plants will be shut down in the coming years. To the people of those states, including California, Vermont and others, the decommissioning process is enormously important because of the obvious impact it will have on them. As you know, when one closes down a nuclear power plant, it means lost jobs. It means lost revenue to the community and lost revenue to the State. Mostly, it is an issue of safety. People want to know what is happening and want the assurance that they will be safe. People want to know – will the process take 60 years or 10 years? Will the company rigorously ensure that the site is free of radioactivity after decommissioning? Where will the nuclear fuel rods be placed? In light of this, do you feel that states and communities affected by the decommissioning of nuclear plants should have a seat at the table when companies like Entergy are drafting their decommissioning plans to make sure that their interests are given due weight during the process?

ANSWER.

The NRC recognizes the need and desire for community involvement in the decommissioning of a nuclear power plant. Decommissioning is a complex process and the NRC believes that decommissioning impacts need to be vetted within the local community. However, the NRC

was created by the Congress to be an independent regulator, charged with ensuring public health and safety and protecting the environment. As an independent regulator, the NRC ensures that all members of the public are given a fair and equal opportunity to comment on a licensee's decommissioning and license termination plans.

NRC regulations currently offer the public several opportunities to review and provide comments on licensee documents during the decommissioning process. Specifically, under the NRC regulations in Title 10 of the Code of Federal Regulations (10 CFR) Section 50.82, the NRC is required to publish a notice of the receipt of the licensee's Post-Shutdown Decommissioning Activities Report (PSDAR) and the License Termination Plan (LTP), make the PSDAR and LTP available for public comment, schedule separate meetings in the vicinity of the licensed facility to discuss both the PSDAR and LTP within 60 days of receipt, and publish a notice of the meetings in the *Federal Register*, as well as other forums readily accessible to individuals in the vicinity of the site. During the meeting, the NRC and licensee can answer the types of questions you raise.

The States have a very specific role in the decommissioning process. The States, through their public utility commissions, have a role in decommissioning planning. For example, the States control the methods used to collect the decommissioning funds from the rate payers and for establishing site restoration requirements. The States can also provide additional requirements through legislation.

For many years, the NRC has encouraged both the licensees involved in decommissioning activities and the States with interest in these activities to work together and form a community

committee to obtain local citizen views and concerns regarding the decommissioning process and spent fuel storage issues. As one example, the State of Vermont formed a Vermont Yankee Nuclear Decommissioning Citizens Advisory Panel (VYNDCAP). The NRC has supported these meetings by providing presentations to the panel on the decommissioning process.

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Commissioner William C. Ostendorff

The Honorable Bernard Sanders

QUESTION 4. *Upholding the accountability of licensees:*

One of the main concerns I have has been highlighted by the Vermont Yankee decommissioning process thus far. Entergy, the licensee, seems to be taking every advantage to use its decommissioning fund to pay for things they shouldn't be using it for, like paying litigation expenses when concerned groups attempt to hold them accountable. This in essence extends the decommissioning process, and is irresponsible – it's a blatant prioritization of the company's bottom line over safety.

What is NRC willing to do to make sure that safe and responsible decommissioning is prioritized over the financial concerns of the licensees?

ANSWER.

The NRC's implementation of the decommissioning regulations is focused on safety, public health, and security. The NRC is committed to ensuring that the radiological decommissioning of the site is completed within the time allotted by regulations and that associated NRC-regulated activities are monitored and ultimately completed in accordance with NRC regulations. To meet this commitment, the NRC has established a comprehensive, regulation-based decommissioning funding program to provide reasonable assurance that sufficient funding will be available for radiological decommissioning of all U.S. commercial nuclear reactors. The NRC's regulations provide decommissioning funding assurance through several layers of

requirements and limitations, which apply from the time of initial licensing through the time of license termination. Specifically, NRC regulations require that, among other things, decommissioning trust funds only be used for legitimate decommissioning activities. Furthermore, regulations require that withdrawals from the fund would not reduce the fund below an amount necessary to maintain the reactor in a safe storage condition in the event of unforeseen conditions or expenses or inhibit the ability of the licensee to complete funding of any shortfalls in the trust needed to ensure the availability of funds for license termination. Compliance with decommissioning and funding assurance regulations for reactors that have permanently ceased operations is verified through a broad monitoring program that includes an onsite inspection program and annual decommissioning funding status reports. If a licensee were to violate the decommissioning funding requirements, the NRC would use its enforcement process to regain compliance.

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The Honorable Bernard Sanders

QUESTION 5. **Price-Anderson and the true cost of the nuclear industry: Is it true that because of Price-Anderson legislation, if there were ever a nuclear disaster like Fukushima at any of our nation's 61 operating nuclear power plants or at the 19 that are being decommissioned, the tax-payers of this country could be called upon to come up with an untold amount of money, maybe tens of billions of dollars, to deal with the cost incurred in that disaster?**

ANSWER.

There are currently 99 operating commercial nuclear power plants at 61 locations. Under the Price-Anderson Act, Congress established a nuclear insurance scheme under which the nuclear industry self-funds approximately $12 billion in public liability protection in the event of a nuclear incident. Large commercial nuclear power reactor licensees are required to carry the maximum level of primary insurance available from private sources (currently $375 million) and are also required to participate in a secondary financial insurance program. Under this program, if a nuclear incident at any participating power reactor results in injury or damage in excess of the primary insurance layer, all power reactor licensees will be charged a retrospective premium up to a specified amount per reactor (currently up to $121.255 million per reactor) per nuclear incident for its pro rata share of the public liability. Thus, the current combined nuclear industry self-insurance under both the primary and secondary layers is approximately $12 billion. This constitutes the current limit of public liability under the Act, and neither the facility licensee nor any other person may be held liable for any claims in excess of that amount. If a nuclear

incident involves damages to the public that exceed the amount of aggregate liability, Congress has committed under the Act to "thoroughly review the particular incident and [to] take whatever action is deemed necessary and appropriate to protect the public from the consequences of a disaster of such magnitude."

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The Honorable Bernard Sanders

QUESTION 6. **Nuclear Regulatory Commission transparency during rulemaking: Every United States Senator has to cast some very difficult and controversial votes, and even though those votes may be distorted, that's our reality, and we must live with that. Is there any reason why every vote that you cast should not be made public?**

ANSWER.

The Commission applies its principles of good regulation—including the concept of openness—to its rulemaking processes. The Commission's votes on rulemaking matters, including proposed rule, final rules, and rulemaking petitions are generally posted on the NRC website upon completion of the voting process (http://www.nrc.gov/reading-rm/doc-collections/commission/cvr/). These votes include detailed explanations of each Commissioner's views on the rulemaking at issue, often with substantive edits and comments. Only in rare cases where a particular rulemaking involves sensitive information requiring protection, such as classified, safeguards, security-related, or proprietary information, are the Commission's detailed votes not publicly released.

Senator INHOFE. Thank you, sir.
Commissioner Baran.

STATEMENT OF JEFF BARAN, COMMISSIONER, NUCLEAR REGULATORY COMMISSION

Mr. BARAN. Chairman Inhofe, Ranking Member Boxer and members of the committee, thank you for the opportunity to appear today before the committee.

It is a pleasure to be here with my colleagues to discuss NRC's fiscal year 2016 budget request and the work of the agency.

First and foremost, NRC is focused on our mission of protecting public health and safety, yet the agency faces a different environment than what was expected just a few years ago. To meet our responsibilities now and into the future, we need to enhance the efficiency, effectiveness and agility of the agency.

Before I joined the Commission, my colleagues had the foresight to initiate Project Aim, an internal working group tasked with looking at changes NRC should make to prepare for the future. This is a valuable and timely effort.

We are actively deliberating on the recommendations of the Project Aim team and I expect that the Commission will approve some prudent actions very soon.

While we work to increase the agency's efficiency and agility, we need to ensure that NRC also maintains its focus on its ongoing safety work. Currently, five new reactors are being built in the United States and five reactors recently ceased operations and are entering decommissioning.

At the construction sites, NRC is conducting oversight to ensure that the new plants are built safely and in accordance with regulatory requirements. Meanwhile, the NRC staff is beginning a rulemaking to take a fresh look at a number of decommissioning issues.

NRC is continuing to address post-Fukushima safety enhancements and lessons learned. Progress has been made in several areas but we recognize that more work remains to be done.

The effort to address flooding hazards at nuclear power plants is a good example. The flooding hazard reevaluations have been proceeding more slowly than anticipated. The Commission recently decided to make some improvements to the process in order to accelerate the analysis while providing more clarity to licensees about the process for determining what additional equipment or modifications may be necessary to protect nuclear plants from floods.

In closing, I recognize that our congressional oversight committees are more interested than ever in NRC's mission and the way we are carrying out that mission. I firmly believe that NRC can provide Congress with the information it needs to perform its oversight duties while preserving the independence essential to accomplishing our safety and security mission.

Thank you and I look forward to your questions.

[Questions for the record and Mr. Baran's responses follow:]

Responses from Commissioner Baran

The Honorable Shelley Moore Capito

QUESTION 1. **Are you satisfied that the NRC staff is following the Commission's direction on the use of qualitative factors in regulatory changes that are currently under development?**

ANSWER.

Yes. In addition, the staff is updating the guidance on the use of qualitative factors as part of the staff's larger effort to update the overall cost-benefit guidance. The updated guidance aims to assist the staff in better articulating how qualitative factors are used in the agency's regulatory analyses to enhance clarity, transparency, and consistency.

Responses from Commissioner Baran

The Honorable Bernie Sanders

QUESTION 1. *States' concerns with existing PSDAR plans*:
On January 27th of this year, the Vermont Attorney General's office sent a letter to you to join the New York and Massachusetts Attorneys General in asking you to investigate the ability of Entergy to pay for decommissioning activities. In this letter, the Attorney General states:
"While Vermont Yankee recently disconnected from the electric grid, there are a number of immediate and long term activities that will occur at the plant that could affect the safety of Vermonters. The State of Vermont has a direct interest in the NRC abiding by its statutory duty to ensure that Vermont Yankee's owners and operators have – and continue to have – the ability to pay for these activities....To determine whether Entergy...has adequate financial means without undue or unauthorized reliance on the [Nuclear Decommissioning Trust] Fund, the NRC should fully investigate the financial qualifications of Entergy and its subsidiaries."
Is it the NRC's duty to ensure that licensees like Entergy are able to finance decommissioning and that involving states in the process would help to ensure that a financially responsible plan is drafted and avoid situations like the one in which Vermonters currently find themselves?

ANSWER.

As Chairman Burns indicated in his response to this question, NRC has a regulatory program in place to provide reasonable assurance that sufficient funding will be available for radiological decommissioning and irradiated fuel management of all U.S. commercial nuclear reactors. States have an important role in determining how funds are collected from ratepayers and establishing site restoration requirements.

Responses from Commissioner Baran

The Honorable Bernie Sanders

QUESTION 2. ***NRC review and decision-making on decommissioning plans:*** **Do you think that the NRC should have to review post-shutdown decommissioning plans (PSDARs) in a clear, transparent, and consistent way before decommissioning plans are officially accepted? Has the NRC ever rejected a decommissioning plan?**

ANSWER.

I support the rulemaking effort that is now underway to take a fresh look at a range of decommissioning issues, including the advisability of requiring a licensee's post-shutdown decommissioning activity report to be approved by NRC. With several plants retiring, I think the agency will benefit from getting public comment on this issue.

Responses from Commissioner Baran

The Honorable Bernie Sanders

QUESTION 3. ***The role of states in the decommissioning planning process:*** **There are a number of states in which nuclear power plants will be shut down in the coming years. To the people of those states, including California, Vermont and others, the decommissioning process is enormously important because of the obvious impact it will have on them. As you know, when one closes down a nuclear power plant, it means lost jobs. It means lost revenue to the community and lost revenue to the State. Mostly, it is an issue of safety. People want to know what is happening and want the assurance that they will be safe. People want to know – will the process take 60 years or 10 years? Will the company rigorously ensure that the site is free of radioactivity after decommissioning? Where will the nuclear fuel rods be placed? In light of this, do you feel that states and communities affected by the decommissioning of nuclear plants should have a seat at the table when companies like Entergy are drafting their decommissioning plans to make sure that their interests are given due weight during the process?**

ANSWER.

I support the rulemaking effort that is now underway to take a fresh look at a range of decommissioning issues, including the appropriate role of state and local governments in the decommissioning process. I agree that states and localities should have their views considered. Currently, there are formal public comment periods after the post-shutdown decommissioning activities report is submitted and again much later when decontamination is nearly complete and the license termination plan is submitted. As part of the rulemaking process, NRC will take public comment on whether this level of public participation is sufficient.

Responses from Commissioner Baran

The Honorable Bernie Sanders

QUESTION 4. ***Upholding the accountability of licensees:***
One of the main concerns I have has been highlighted by the Vermont Yankee decommissioning process thus far. Entergy, the licensee, seems to be taking every advantage to use its decommissioning fund to pay for things they shouldn't be using it for, like paying litigation expenses when concerned groups attempt to hold them accountable. This in essence extends the decommissioning process, and is irresponsible – it's a blatant prioritization of the company's bottom line over safety.
What is NRC willing to do to make sure that safe and responsible decommissioning is prioritized over the financial concerns of the licensees?

ANSWER.

Chairman Burns' response details the NRC's commitment to ensuring that decommissioning is completed in accordance with NRC regulations and an established funding program that provides reasonable assurance that sufficient funding is available. With respect to Vermont Yankee, the NRC staff is currently reviewing a January 2015 request from Entergy for an exemption to allow use of a portion of the Vermont Yankee decommissioning trust fund for the management of irradiated fuel consistent with the licensee's updated irradiated fuel management program and the post-shutdown decommissioning activities report. NRC staff would only grant such an exemption after independently reviewing the licensee's request to verify that NRC regulations would still be met, including a determination that sufficient decommissioning trust funds are available to complete the radiological decommissioning of Vermont Yankee.

Responses from Commissioner Baran

The Honorable Bernie Sanders

QUESTION 5. **Price-Anderson and the true cost of the nuclear industry: Is it true that because of Price-Anderson legislation, if there were ever a nuclear disaster like Fukushima at any of our nation's 61 operating nuclear power plants or at the 19 that are being decommissioned, the tax-payers of this country could be called upon to come up with an untold amount of money, maybe tens of billions of dollars, to deal with the cost incurred in that disaster?**

ANSWER.

I concur with the description of the Price-Anderson Act provided by Chairman Burns in his response to this question.

Responses from Commissioner Baran

The Honorable Bernie Sanders

QUESTION 6. **Nuclear Regulatory Commission transparency during rulemaking: Every United States Senator has to cast some very difficult and controversial votes, and even though those votes may be distorted, that's our reality, and we must live with that. Is there any reason why every vote that you cast should not be made public?**

ANSWER.

I agree that the Commission should strive to maximize the transparency of its decision-making. As a general matter, my votes as a commissioner are public. There are a limited number of cases where it may not be appropriate to release the text of votes. For example, some votes include adjudicatory or security sensitive information. In cases where my vote has included security sensitive information, I worked with the NRC staff to publicly release as much of the vote as possible.

Senator INHOFE. Thank you very much.

I am going to make an observation and ask if each of you disagree. The notion that the NRC has done nothing in response to Fukushima just isn't true.

I understand the NRC has responded to congressional questions. I have seen the list. There have been as many as 35 post-Fukushima recommendations. The most safety significant of these either has been implemented already or will be implemented by the end of the year.

I understand the industry expects to spend approximately $4 billion on post-Fukushima safety requirements. Clearly, we have been very busy.

I would also observe that Japan was not as prepared for an extreme event as our industry was. In fact, a Japanese government report, their report, noted that the equipment the NRC required, that is us, following September 11 might have made the difference at Fukushima. In addition, the NRC required our plants to add backup power and generators to coup with station blackouts starting in the 1980s.

Does anyone disagree with that? Thank you very much.

You heard my opening statement. I think I probably observed accurately that you four are the only ones who understood what I said because it is a bit complicated, but it is a history we have to look at because it is real.

According to Project Aim, the 2020 Report, the NRC's current staffing level is 3,677 full-time equivalent employees, excluding the Inspector General's Office. Your fiscal 2016 budget requests 3,691 full-time equivalent employees which is a slight increase.

Chairman Burns, if Project Aim recommends shrinking to a work force of 3,400 why request an increase for 2016?

Chairman BURNS. I don't think we are requesting an increase in the number of staff for 2016. I think, Mr. Chairman, the difference between our 2015 and 2016 proposal is this. In 2015, the appropriated amount was smaller than our request for 2016, but in 2015, because we had a substantial carryover, the Congress allowed us—I think it is on the order of $38 million to $40 million in carryover.

Our overall request for 2016, if you compare it to that appropriated amount and that carryover amount, is smaller for 2016. We are looking at, I think, a reduction in 2016 of about 140 full-time equivalent positions.

Senator INHOFE. I notice you are glancing at this chart. You know what this chart is. Do you agree with it?

Chairman BURNS. Unfortunately, I can't. It is hard for me to read, my eyes aren't the best.

Senator INHOFE. Staff, point out the surge that takes place about the fourth column over to the right. What year is that because I can't see that either—2002, is it? Yes. Anyway, I want you to look at that and we should have had that in front of you because I think this is accurate in terms of its content.

I understand what you are saying. If we do find that it is excessive, I want you to reevaluate that.

According to the NRC's annual attrition rate of 5 percent, this is what I understand it is, the NRC could reach the Project Aim recommended staff level in fiscal year 2017 if it began with the

2016 budget. I would ask the same thing of Chairman Burns, why would it take to 2020 to achieve that reduction?

Chairman BURNS. Senator, I think part of the answer is that in looking at Aim, they were looking out to 2020 in terms of where they thought a potential staffing level would be. I think we want to be careful because we want to be responsible in terms of what it is we think we need in order to meet our objectives.

I would be hesitant to say just flat out that in the 2017 timeframe or 2018, before that, that is where we ought to be. There is work we need to do. We need to bring the Fukushima improvements home. We have some new reactor licensing.

Senator INHOFE. You are doing a lot of that now.

Chairman BURNS. Yes, we are doing that now but there is work that carries through 2016 to 2017 in a number of areas. Again, I think given what we understand now, that is where I think the line or the slope is we would have.

Senator INHOFE. How about the other three of you? Do you think it is unreasonable for us to expect and to go back and have something at the level of 2000 if we are using that to measure the number, the workload, and number of employees in the budget? Do any of you disagree with that, that you ought to be able to do what we did with the same thing in 2000?

Ms. SVINICKI. I would just remark that the goal laid out for Project Aim was merely a staff estimate for a reduction. The Commission, itself, is right now reviewing the work that needs to be done and the staffing level. The Commission does not endorse that.

It may be that it is too modest or too ambitious but we have not yet looked at the work scope to support the staffing but I think there is general acknowledgement that the staffing will be coming down.

Senator INHOFE. OK.

Yes.

Mr. OSTENDORFF. Senator, I would just comment and add that I do believe taking a historical look at prior budget and staffing numbers does provide a perspective that should inform how we move forward.

Senator INHOFE. My time has expired but if we do have a second round, I want to get into the IG report. I think you are familiar with that and I have some questions along that line.

Senator Boxer.

Senator BOXER. Thank you.

I want to go back to the list of 12. The point is we were told by the former Chairman that a lot of these recommendations would be required to be implemented within 90 days of Fukushima. That is in the record.

You don't have to agree with it. I am not asking about that but the fact is we don't have any required implementation by the Commission for anything until 2016. My question to all of you is, do you intend to extend that or are you going to stick with the ones where you say you will have 2016 action? Is there any intent to extend that period to the industry?

Chairman BURNS. Senator, when I came on as chairman, one of my priorities is to see these things home. What you have in terms of 2016 is the schedule for implementation that I believe the Com-

mission, actually, it would have been when I was general counsel, adopted in terms of the implementation.

Senator BOXER. Just answer the question, do you plan?

Chairman BURNS. I do not plan, based on what I know now in terms of the progress made, to do that. As I said, there are a few instances, to be sure we are clear and honest with each other.

Senator BOXER. OK, fine. The answer is that you don't intend to.

Chairman BURNS. I don't intend to do that.

Senator BOXER. Also, since you have taken no action on several of these, there were only 12, let us be clear, from the Commission. There were 12 recommendations. I am going to ask you to put in writing, all of you, I am going to follow up, why you have not acted on some of these and what your intentions are. We will get that letter to you.

I want to home in on a shocking situation at home. I am asking all of you to comment on this. I will start with Ms. Svinicki.

On September 10, PG&E submitted a seismic safety report on Diablo Canyon, which it was required to do, by the State of California and the NRC. That report found that the shoreline seismic fault was more than twice as long as previously believed. On September 10, they submitted this report.

What we have found out, with some diligent work by my staff, is that the NRC's press office circulated internally a memo on August 24, 27 and 28, all containing talking points saying the NRC has reviewed the report and concluded Diablo Canyon was seismically safe.

Let me say that again for the committee here. You do not get the report until September 10, actually, you got it on September 8, but in August, your communications people put out an internal memo stating that everything was cool and it was seismically safe when we know it is not true.

I would like to ask each of you to respond to this. Did you know about this? Now that you know about this, will you investigate why this happened?

Ms. SVINICKI. I did not know about this and I believe this may already be under investigation.

Senator BOXER. Yes.

Mr. OSTENDORFF. I agree with Commissioner Svinicki's answer. I did not know about it.

Senator BOXER. Do you know if it is under investigation, Mr. Burns?

Chairman BURNS. I do not. If this happened, this occurred actually before I was confirmed.

Senator BOXER. I understand that, so this is the first you have heard, but Ms. Svinicki, since you said it is under investigation, who is investigating it?

Ms. SVINICKI. I believe it would be the Office of the Inspector General, but Senator, I am not entirely sure.

Senator BOXER. My understanding is it is not under investigation and this has to be done. I am asking you, Mr. Chairman, if you will get back to me on this? This is appalling. It is about my people surviving if there is an earthquake right there. Will you look into this? Heads should roll on this. You do not writing talking points before you even get the document.

Chairman BURNS. I will look into it and get back to you.

Senator BOXER. I need it in writing as well.

This morning, I reintroduced my legislation to prevent exemptions from having to prepare emergency responses when there is decommissioning going on. We have examined this.

NRC has never once rejected such a request even though the studies have found that the health consequences a spent fuel accident could be as bad as the consequences of a severe accident.

I want to know from you whether you are now taking a look at these kinds of automatic exemptions for the plants. Are you taking another look at that?

Chairman BURNS. The Commission has directed initiation of a rulemaking on decommissioning which would look at the process for entering into decommissioning which would include a look at the exemption process in terms of trying to develop a more transparent and regulatory framework as we go forward.

Senator BOXER. I hope that means you are not going to automatically grant these exemptions because I have to tell you something. If something happens to somebody and they are hurt in a terrible nuclear accident because of what leaked out of the plant, it does not matter to them if it happened before the decommissioning or after. We need to not just grant these exemptions.

Thank you very much, Mr. Chairman.

Senator INHOFE. Thank you, Senator Boxer.

Senator Fischer.

Senator FISCHER. Thank you, Mr. Chairman.

I have a chart to put up. This was compiled by the Nuclear Energy Institute and it represents all the scheduled initiatives that at the Commission. Mr. Chairman, I have raised concerns about the impacts of regulation before and I think this chart illustrates those concerns really well.

It also shows all the scheduled regulatory initiatives at the NRC, including the progress of the post-Fukushima Tier 1 recommendations about which Ranking Member Boxer expressed concern as well.

We see a lot of new nuclear regulatory requirements, in addition to our expectation that plants are operated at the highest levels of safety every single day. This is an issue that the NRC has been considering since 2009 and one that the NRC staff agrees "can potentially distract licensee or entity staff from executing other primary duties that ensure safety or security."

As you know, Senator Vitter and Congressman Upton asked the GAO to review NRC's cost estimating. The GAO found that NRC's cost estimating procedures "do not adequately support the creation of reliable cost estimates."

The NRC appears to have dismissed the recommendation to use GAO's cost estimating guide in favor of OMB's, which I think is far less detailed.

Considering the NRC's pattern of underestimating costs, sometimes by more than 1,000 percent, do you think it is wise to reject the GAO's guidance?

Chairman BURNS. My understanding, with respect to our views or the agency's views on the GAO's guidance, is that the particular GAO guidance was designed for basically, I think project construc-

tion and things like that, which are not quite a match for what we do.

Having said that, this is an area in which the agency has focused attention. We are taking steps to try to make sure we are better with cost benefit analysis in the areas where it is applied. I think we have reached out to the industry here to make sure we have a better understanding of costs because I think this is an area in which we can do better.

While I disagree in terms of the issue on the GAO, I think we are ready and I think we have been trying to take some steps that address some of the concerns.

Senator FISCHER. When you look at the new regulations, again, you tend to under estimate the cost. The Energy Institute would say that the actual cost, for example, to implement worker fatigue rules were two to five times your estimate. The new fire protection regulations were six times your estimate. The new security requirements were 19 times your estimate.

How do you respond to that?

Chairman BURNS. Again, I think we have to make sure our processes—we have looked at the input we get from the industry on those questions and hopefully feed it back into the rulemaking process.

This is an area where we have committed, both in the cost benefit area and the cumulative effects area, to do more work. We have engaged with the industry on that to move forward.

Senator FISCHER. Thank you.

Commissioner Ostendorff, in recent hearings of the committee, I have asked questions about the use of qualitative factors in the decisionmaking of your commission. It is my understanding that in a vote on March 4, 2015, you disapproved of the expansion of the NRC staff's use of those qualitative factors beyond the current context in which these factors are considered.

I would like you to describe, first, the current role that qualitative factors play in the staff's decisionmaking process. Second, I would like your views on the appropriate role for the use of qualitative factors going forward and perhaps limitations on them.

Mr. OSTENDORFF. Thank you for the question, Senator Fischer.

Very briefly, I think whenever there is an opportunity and the ability to use quantitative factors, we must use those factors. There are some areas where there is not an easily quantifiable approach to look at the problem. In those cases, and they are limited in number and scope, there are times when the Commission needs to be aware of how our staff might look at this non-quantitatively but through qualitative factors. At the end of the day, the decision on whether or not that approach would be based upon a qualitative approach rests with this Commission.

Senator FISCHER. Thank you, sir.

Thank you, Mr. Chairman.

Senator INHOFE. Thank you, Senator Fischer.

Senator Capito.

Senator CAPITO. Thank you, Mr. Chairman. I would like to thank the panel as well.

I want to follow up on Senator Fischer's line of questioning in terms of the use of qualitative factors.

As she mentioned and you also mentioned to Mr. Ostendorff, the use of qualitative factors is limited historically only to those situations where the cost benefits cannot be amenable to quantification.

The Commission recently issued direction to the staff regarding the use of qualitative factors in regulatory and backfit analysis stating, "This approval does not authorize an expansion of the consideration of qualitative factors in regulatory analysis and backfit analysis."

Your direction also listed the principles that you expect the staff to follow: one, improving its methods for quantitative analysis; two, developing realistic cost estimates; three, limiting the use of, as you said, qualitative factors to certain areas; and improving transparency of decisionmaking in the use of qualitative factors.

I guess I would ask the Chairman, are these instructions largely reinforcing the existing practice, in your mind?

Chairman BURNS. I think so. From that standpoint, again, I think the direction was the staff should continue under the direction it has had and that is the preference, if we have the ability to use quantitative information to make those judgments, that is what we ought to be doing.

I would defer to my other colleagues if they want to add anything.

Senator CAPITO. Who actually oversees the decision, making sure that the staff goes with the instructions that the quantitative instructions are largely in place over qualitative? Is that a decision you make?

Chairman BURNS. Certainly the Commission has a role in that, but the Commission having given direction, we would expect our Executive Director for Operations, our chief staff officer, to ensure the Commission's will is carried out through the staff.

Mr. OSTENDORFF. I want to add to the Chairman's comment.

Senator CAPITO. Yes.

Mr. OSTENDORFF. When a paper comes to the Commission for a decision on a policy matter, we expect, and I think it has been the practice, that the regulatory approach, the regulatory analysis the staff is using is clearly presented to the Commission so we have the ability to see what their thinking is.

Senator CAPITO. And how they arrived at the decisions?

Mr. OSTENDORFF. Exactly.

Senator CAPITO. That is a part.

Mr. OSTENDORFF. A part of our process.

Senator CAPITO. Part of the process.

Whoever wants to answer this question, my question would be if qualitative analysis could be used to justify a regulatory change that failed a quantitative cost benefit analysis, could that open the door for the NRC to justify basically any regulatory change? Would you agree with that statement?

Ms. SVINICKI. I think one of the reasons that we deliberated and issued the instruction or direction on use of qualitative factors you have been quoting from was just that concern, that an unlimited, unfettered use of soft or qualitative factors could be used to obscure the true cost benefit of a new regulation and therefore, we had these elements of maybe constraining, continuing many practices of the use of qualitative factors but making more explicit the identi-

fication of how that was part of the analysis so that we can have clarity in our evaluation of any recommendations from our staff.

It is, I think, in some ways, to be certain that we don't venture near those types of abuses.

Senator CAPITO. Any other comments?

Chairman BURNS. I think Commissioner Svinicki submitted a good synopsis.

Senator CAPITO. Thank you, Mr. Chairman.

Senator INHOFE. Thank you.

Senator Sullivan.

Senator SULLIVAN. Thank you, Mr. Chairman.

Mr. Chairman, it is good to see you. Thanks for the work that you do.

In Alaska, we don't have any nuclear facilities, so this is my first hearing with regard to the NRC. I always start the hearings by looking at the mission, what you do, the mandate from Congress and the fact that you are an independent agency.

Mr. Chairman, would you like to comment, just from your perspective around the agency, what you think it means to be an independent Federal agency in Washington right now? I think sometimes people forget that word "independent" and what it means and how important it is.

Chairman BURNS. Thank you for the question. In my prior work at the OECD Nuclear Energy Agency that was often a question and debate, not a debate but discussion as well.

I think to me, again, independent agencies were set up in a way to be bipartisan but in the sense that the expert judgment that an agency can bring to bear, that basically the agencies are created to bring to bear expert judgments in the areas of their competence. I think maybe that is the hallmark.

There are probably other characteristics but certainly how they are structured in terms of, in our case, no more than three members can be from the same political party or registered from the same political party, and the openness in terms of meetings. Things like that, I think, enhance our independence.

Senator SULLIVAN. With oversight from the Congress?

Chairman BURNS. With oversight from the Congress, absolutely.

Senator SULLIVAN. With policy direction ultimately from the Congress in the form of legislation?

Chairman BURNS. Yes.

Senator SULLIVAN. Not the White House or the Executive branch?

Chairman BURNS. No. That is another aspect. Our appointments are for terms and removal can only be—except the Chairman can be replaced on a day to day basis. Sometimes maybe that would be good from my standpoint but the idea is, again, commissioners basically serve that term unless removed for malfeasance.

Senator SULLIVAN. I want to talk just a little bit about the budget. From 2004 to 2014, your budget increased by more than $400 million, 800 more staff and yet the NRC struggled to review 40 percent fewer licensing actions in 2014 compared to 2004.

In particular, as you know, 90 percent of the budget to the NRC comes from fees paid either for license fee specific work or annual fees billed to operating reactors. With the Office of New Reactors

having less work, it appears—I would like you or any of the other commissioners to address this—and with the shutdown of two reactors, the remaining reactors are going to make up a shortfall in terms of an additional $100 million paid this year. Is that correct?

How will the Commission avoid forcing current power reactors to pick up additional shortfalls in new reactor revenue in this year's budget and in the next if there is going to be additional closure of facilities?

To get to a broader point, do you think that is a sustainable model because it does seem that the annual fees required of the existing operating fleet become more and more and more. It seems to me that is a pretty significant burden and a model that might not be sustainable.

Chairman BURNS. I think the model is sustainable in terms of looking at the size of the current fleet. That is plus or minus some when I say that. At one point during the agency's history, we were not a fee-based agency, I think up through the mid-1980s.

Again, it is true and that is how the fee provisions work. It depends on the number of operating reactors. That is currently 99. The expectation, depending on the final outcome of the reviews of Watts Bar II, I think the estimate is it would go into operation later this year. That would be back to 100. There is, I agree, some variability there.

The overall, given our request, is that the fees will go down, are estimated to go down not only for fiscal 2015 but if you look at this budget proposal, in 2016 as well.

Senator SULLIVAN. Thank you, Mr. Chairman.

Senator INHOFE. Senator Gillibrand.

Senator GILLIBRAND. Thank you, Mr. Chairman. Thank you, Ranking Member Boxer.

I am grateful that the NRC Commissioners are here to testify about the work of the Nuclear Regulatory Commission.

The safety of our nuclear power sector is of great importance to me and New Yorkers. Our State has four nuclear power plants. I am very focused on making sure that the NRC can provide the strong and consistent oversight to ensure those plants operate safely and that the lessons learned from previous tragedies are implemented.

We discussed this in past but Super Storm Sandy wreaked havoc throughout the New York City region, including Westchester. One of the challenges during Super Storm Sandy beyond the 10-foot surges was the amount of downed power lines and trees, particularly throughout the Westchester region and the Hudson Valley coming out of New York City.

I want a fuller discussion of an evacuation plan if you have the perfect storm, if you have a nuclear incident. I don't think you have ever submitted an evacuation plan beyond 10 miles. The reality is that Indian Point has a very close proximity to 8 million people.

Could you speak to whether you have assessed a broader evacuation plan and if not, why not and if not, will you please submit it in writing? Anyone can answer.

Chairman BURNS. I will start and my colleagues may want to add something.

Again, the emergency planning basis that the agency adopted, the basic rulemaking provisions, address detailed planning, not just evacuation but other types of potential responses within a 10-mile radius and then going out to 50 miles for what are called ingestion pathway zones.

That has generally been considered by our staff, our information and from working with other Federal partners to be a consistent and also adequate basis for planning.

I think long term, we have always been open to potentially looking at that issue. I think parts of the Tier 3 Fukushima review may address it and see if there is anything else we can learn to address that. I will leave it there if any of my colleagues want to add something.

Mr. OSTENDORFF. I would just add, Senator, that NRC does this in concert with FEMA and FEMA has the broader national response authority to ensure coherency and commonality of approaches. I wanted to assure you that it is not just the NRC looking at the evacuation plans; it is also FEMA through their broad national responsibilities.

Senator GILLIBRAND. How many other nuclear plants around the Nation are within a 50-mile radius of a population of 8 million?

Mr. OSTENDORFF. Senator, I think it is very clear that Indian Point—two of my three adult kids live within that radius.

Senator GILLIBRAND. I just think it is inconsistent with other evacuation plans and doesn't have the same needs because it happens to be positioned far differently than the typical nuclear power plant.

For example, the other power plants in New York State are in rural areas where you have significant ability to evacuate anyone within a 50-mile radius. You do not have that in New York City. You have an enormous population with very few avenues to evacuate.

I think it is a really complex problem that needs unique attention. I do not think saying it is consistent with the rest of the Country is correct because there is no other fact pattern that is similar to where Indian Point is.

I would like a unique approach to absolutely be planned for and analyzed to know what the limitations are and to think it through.

Mr. OSTENDORFF. Senator, with that question for the record, may we have the chance to get back to you in writing?

Senator GILLIBRAND. I would really appreciate that because I have raised it several times. I would like you to do a specific, specialized plan for Indian Point evacuation beyond the 10-mile radius that you have done because Super Storm Sandy truly is a wake-up call. With global climate change as it is, rising sea levels, rising sea temperatures, more intense storms have higher storm surges, have more rain, flooding is absolutely possible.

The location of Indian Point geographically is problematic because it is on the Hudson Valley. It is poised just north of New York City. It is very close to coastal areas. We also have seismic activity in that region. You do have real geographical issues beyond the massive population base.

I would like a thoughtful analysis about what you would do in the worst case scenario given Fukushima. That was the worst case

scenario, one that nobody had planned for, no one could have imagined, and it was, as a consequence, deadly.

Please do that analysis and provide it to me.

Thank you, Mr. Chairman.

Senator INHOFE. Thank you, Senator.

Senator Barrasso.

Senator BARRASSO. Thank you very much, Mr. Chairman.

Chairman Burns, thank you and I appreciate your being here today.

I have some concerns about the NRC's proposed changes to the fee recovery rule. I want to follow up a bit what Senator Sullivan talked about.

This is the rule where the NRC charges fees to the licensees to recover most of its budgetary authority. A quote from the Federal Register back in 2005 talks about the comments objecting to the large increase in the annual fees for uranium recovery licensees. The commenters stated, "There continues to be a lack of reasonable relationship between the cost to uranium recovery licensees of NRC's regulatory program and the benefit derived from these services."

Additionally, the commenters stated, "The NRC needs to address the issue of decreasing numbers of uranium recovery licenses. Specifically as more States become agreement States and/or additional sites are decommissioned, the number of NRC-regulated sites continues to decline leaving fewer licensees to pay a larger share of the NRC's regulatory cost." That was 10 years ago. It continues.

It seems you are overseeing about half the operations facilities that you did in 2005, and reviewing less than half the number of applications reviewed as recently as 2008. NRC's press release on the proposed rule on March 23, a couple weeks ago, stated "Most uranium recovery licensees would see an increase in their fees."

With each State that becomes an agreement State, the workload dropped for the NRC but the fees go up anyway. It could take up to 5 years for Wyoming to become an agreement State, a process you have noted in your written testimony.

My State has just started. In the meantime, our uranium operators are seeing their fees go up, even though the workload is going down. I had a letter 2 months ago talking about an invoice they recently received. The invoice was roughly four times the amount their staff had accrued based on their estimate of the level of effort the NRC staff is expending on or behalf of the biweekly validation reports.

You can imagine my surprise and concern with this variance but surprise and concern have become routine with the quarterly NRC invoices emblematic of a lack of fiscal accountability at NRC.

Given the workload is down, how do you continue to explain the dramatic increases in fees? Is this practice sustainable?

Chairman BURNS. Senator, I have not had a chance to see some of your details but again, this goes to the comments I made in the discussion with Senator Sullivan. In some areas where you have fewer licensees, that does have an impact on the fees.

I think what we can do and try to commit to do, as part of this, is say the fee rule is out for comment and our deliberation and determination assure that we have done our best in terms of equi-

tably reaching a decision on the final rule, taking onboard the expressed concerns. That is what I can tell you I intend to do.

Senator BARRASSO. I appreciate that.

Regarding the time it takes for the NRC to provide services to licensees, how long do you believe it should take the NRC to review an application for a new uranium recovery facility? Do you know how long it actually takes now?

Chairman BURNS. I am not sure I can give sort of an ideal time. I haven't had a chance to look at that. I had a meeting with Senator Fischer yesterday and I know her concern in terms of the length of time it took for renewal of the Crow Butte license.

Quite honestly, in the uranium recovery area, some of the complications are the ancillary reviews that have to be done. I think this is an area I am willing to look at and see we are trying to do better.

Senator BARRASSO. My final question is, I am concerned that the EPA is currently taking jurisdiction away from the NRC with its proposed and costly Part 192 rulemaking that would essentially require uranium producers to monitor water quality for up to 30 years after the mine stops producing uranium.

I wondered if your Office of General Counsel has evaluated the jurisdictional aspects of this proposed EPA Part 192 rulemaking and what was that evaluation?

Chairman BURNS. I would have to discuss that with the General Counsel. I would be happy to get back to you on that.

I do know from past experience, there is some jurisdictional overlap with the EPA. Unfortunately, I cannot tell you today with respect to the new rule.

Senator BARRASSO. I would appreciate it if you would have this evaluated and report the findings back to this committee.

Thank you, Mr. Chairman.

Senator INHOFE. Thank you, Senator Barrasso.

Senator Markey.

Senator MARKEY. Thank you, Mr. Chairman.

In May 2011, I released a report, Fukushima Fallout. This report pointed out the problems with American nuclear power plants in the wake of what we have learned about the Fukushima accident.

It talked about how we rely upon outdated seismic information and how our plants might be unprotected. It said that power outages in our Country could lead to Fukushima-style meltdowns or accidents right here in the United States of America.

In July 2011, 2 months after my report came out, the NRC's expert task force released 12 recommendations that all addressed weaknesses here in this Country, including the ones that I raised in my report.

As we sit here today, not one single new permitted, seismic safety upgrade has been required to be put in place. Not a single new measure to prevent floods from causing a meltdown to occur has been put in place. Not a single new emergency response procedure has been put in place. That is unacceptable.

The problems were identified in my report in 2011. The advisory committee, the NRC's own expert panel, identified these same problems. It is continuingly impossible for me to understand why the NRC does not act on this area, why we haven't implemented

the lessons that we should have already learned from the Fukushima accident.

It is time for the United States to act as though we understand that nuclear power here has to learn from the nuclear power mistakes of other countries. I do not think we have done that up until this moment.

On the issue of cyber security, after the terrorist attacks of 9/11, the NRC issued cyber security orders for nuclear reactors which later turned into even more robust regulations but the NRC did not require the same stringent cyber security measures for other nuclear facilities like centrifuge facilities that enrich uranium.

Now we know that the United States and Israel used the Stuxnet computer virus to damage Iran's centrifuges and slow down its nuclear weapons program. I am sure that is part of the reason why the NRC staff recommended that the NRC quickly issue orders to upgrade the cyber security requirements at American enrichment facilities and then do a rulemaking just like the NRC did for its reactors. What is mystifying though is why the NRC voted three to one to reject the staff's recommendations.

Commissioner Baran, you were the only one to support the NRC staff's recommendation. Can you tell us why?

Commissioner BARAN. Sure, Senator. The NRC staff spent years looking at this issue. They did site visits at our fuel cycle facilities. They talked with licensees for a period of 2 or 3 years largely trying to reach agreement on voluntary actions that the fuel cycle facilities would take to establish basic cyber security standards.

After all that effort, their conclusion was that there were significant vulnerabilities that needed to be addressed in order to protect the health and safety. I agreed with the staff that NRC should issue orders and then follow with a rulemaking so that we do not have years where we are waiting to have basic cyber security protections in place that are enforceable.

Senator MARKEY. I agree with you, Commissioner Baran.

NRC is still refusing to comply with my document request that could be related to the indictment of five members of the Chinese military on charges of hacking into U.S. company systems in 2010 and 2011 and stealing nuclear reactor trade secrets from Westinghouse.

At the very same time these thefts occurred, Westinghouse was hosting dozens of unescorted Chinese personnel at U.S. nuclear reactors for months. The NRC has refused to provide me with any documents I have requested even though Congress is about to be asked to approve a new nuclear cooperation agreement with China.

Anonymous sources have sent me some materials. For example, in November 2010, NRC's Security Office recommended that additional information about each Chinese national be provided in advance of the visits so they could be checked against other security databases but the NRC ultimately rejected this recommendation and they did end up gaining unescorted access to nuclear reactors in this Country according to documents that were sent to me.

The law I wrote requires the NRC to provide non-public documents to Congress. It is vitally important that Congress be fully informed about the potential risk of Chinese cyber espionage before it approves a new nuclear cooperation agreement with China.

Do each of you agree to follow the law and fully respond to all of my outstanding document requests, yes or no? Mr. Chairman.

Chairman BURNS. Mr. Markey, the prior Commission, when I understand these requests were made, we indicated we would meet with your staff and discuss the matter with respect to the documents and the issues with respect to it. That offer still stands.

Senator MARKEY. Yes or no, will you provide the documents?

Chairman BURNS. We offered to meet with your staff to discuss the matter. That is my answer.

Senator MARKEY. No one has offered that. No one has provided that.

Senator INHOFE. Senator Markey, let me interrupt for just a moment. We are going to have a second or third 3-minute round. Do you want to take yours right now? You are already 2 minutes into it. I would be glad to give you that time.

Senator MARKEY. I thank you, Mr. Chairman, very much. Yes, I will just take that time right now.

The other commissioners, do you believe that you should follow the law and fully respond to all of my outstanding document requests? Commissioner Baran.

Commissioner BARAN. Obviously, we should follow the law. My view is when NRC gets a document request from a member of one of our congressional oversight committees, we should review the documents that would be responsive and we should work with you or whoever the requester is to provide as much information as we can.

Senator MARKEY. The other two commissioners, do you agree?

Mr. OSTENDORFF. Senator Markey, I agree with Chairman Burns' response.

Ms. SVINICKI. I agree with Chairman Burns' response.

Senator MARKEY. OK. Let me just tell you this. We are about to be asked as a Congress to approve a new nuclear cooperation agreement with China. This committee has a right to have access to this information. We are the committee of jurisdiction overseeing the Nuclear Regulatory Commission.

There is a huge issue with regard to China and the security of our nuclear secrets that is in question. There are outstanding questions going to the Nuclear Regulatory Commission that have not been responded to.

I believe it is irresponsible for that information not to be provided to this committee so that we can evaluate before we are asked to vote on a new Chinese nuclear agreement.

I thank you, Mr. Chairman.

Senator INHOFE. Thank you, Senator Markey.

Senator Carper, you are recognized for a 5-minute round and you have a remaining 3 minute-round.

Senator CARPER. Thank you.

Hello, everyone. It is nice to see all of you and welcome a bunch of you back and to see others for the first time.

In the last decade, I think we have seen a huge swing in the marketplace, as you know, for nuclear energy. I think in 2008, we had 26 applications for building plants and now we are trying to build four.

Both of you, Chairman Burns and Ms. Svinicki, I think were at the NRC in 2008 during that time. As you know, there was very high employee morale. In fact, you topped the charts year after year, the NRC, best and brightest people wanted to come to work at the NRC. We also saw a jump in interest in the career engineering programs at our colleges and universities across the Country.

Things are different today. How do we ensure that the best and brightest still want to come to work at the Nuclear Regulatory Commission and stay there? How can we ensure that the U.S. still produces the best nuclear engineers in the world? How does our budget, the President's budget presented to us address those issues?

Chairman BURNS. Thank you for the question.

It is probably easier in an environment where there is a lot of growth to really pump up morale. But my message to employees is, there is a lot of important work that this agency does. It is not only in regulation of the operating reactor fleet. There is new reactor work. It is doing things like learning the lessons from Fukushima and implementing those requirements.

Also, in the area of medical, we had a great meeting earlier this week from our advisory committee on medical isotopes. There is important work there understanding the beneficial uses of radioactive material and ensuring those uses are safe. Communicating that message, for us at the top, I think doing that helps a lot.

Ms. SVINICKI. I appreciate the question as well.

My understanding from our human resource specialists is that our recruitment is still very vibrant, that young people entering the field are still very interested in applying for positions at the Nuclear Regulatory Commission.

I think they are motivated and excited by the mission of the agency and the opportunity to do exciting work.

Although you didn't ask, as I reflect, this December I will have been a Federal employee for 25 years. I think I have more concerns that young people will perhaps not be interested in Federal Government, civil service or public service positions.

I know to a person, all members of our Commission go out and meet with young people and with students to try to tell them that careers in government and public service are still exciting and gratifying.

I do sense from some of the young people that they take a lot of the negative perception of Washington or public service. I personally think a lot of us advocate for the excitement of these careers.

Senator CARPER. Good. One of the greatest sources of joy I think in the lives of most people is if what they are doing in life is worthwhile and the idea that we have an obligation to serve and if we do, we find that we are making the person being served feel better and it sort of comes around to make us feel a lot better about our own lives as well.

Thank you all for being servants. For those from Delaware who are listening, thank you for letting me serve you.

Chairman Burns, you have a fairly long history at the NRC, as we know. I think you mentioned in your testimony some of the ex-

citement that was going on a few years ago in terms of a lot of activity and a lot of projects on the horizon.

The NRC has to be flexible and the budget has to be flexible when the demand is up and a lot going on and maybe less when there is only four projects to be overseen, plus another 100 nuclear power plants.

How does this budget allow the NRC to be flexible to meet unexpected challenges? What challenges do you believe will be the toughest for the NRC to tackle during your chairmanship?

Chairman BURNS. I would mention three areas. One, it allows us to bring what we see as significant Fukushima enhancements home. It gets us there. It gets us, if not to the very end, very close to the end path. I think that is important.

The second thing is it helps us work off things like the licensing backlog that happened due to our focus on Fukushima.

I think the third thing is that we do position ourselves for the potential for either small modular reactors or advanced reactors. There is money in there to help position ourselves for doing it.

All that said, it continues our vital inspection and oversight mission which is key to maintaining the safety of both reactor and materials use in the U.S.

Senator CARPER. Thank you.

Mr. Chairman, thank you for letting me jump in like this. We have the Commissioner of the IRS before our Homeland Security Committee today on April 15, very timely. I have been trying to adjust the hearing to come here and spend some time with you. It is great to see you all.

Thank you so much.

Senator INHOFE. In light of that, thank you for showing up.

Senator CARPER. You bet.

Senator INHOFE. Let me make a couple comments. First of all, as you can tell, you knew this in advance, we have different approaches and ideas of where in the mix nuclear should be. You know that I am a very, very strong proponent and feel that we need to catch up with some of the other countries that are able to provide a lot more energy from this source. I am going to be working in that direction.

There was a report by the IG on the management directive for budget formulation that had not been amended since 1990 and was "thoroughly out of date." In particular, the IG observed that "lack of written policies and procedures that clarify the roles and responsibilities of key participants in the budget formulation process result in inefficiencies, particularly work flow disruption, confusion and rework."

Commissioner Svinicki, I know that you have worked to develop an update to that management directive I think going all the way back to 2008. I would like to know where we are on that and what your feeling is on going forward with something like that?

Ms. SVINICKI. Thank you, Chairman Inhofe.

This is Management Directive 4.7 within the Nuclear Regulatory Commission and it is a long, outstanding Inspector General finding that this management directive is not reflective of current processes that does lead to inefficiencies. Back in 2008, then-Chairman

Klein asked me to convene a group of staff to look at updating that directive.

I offer no excuse for the fact that in 2015, that directive is still not updated. As often happens in large organizations, we continue to make tweaks and changes to the process. When we sat down to put pen to paper and update the directive for the process, we say we have some additional changes on the horizon so we fall victim to this notion of putting off the update until all the changes are in place.

Our new Chief Financial Officer has taken this on as something that has been outstanding for too long. I have met with her on it and I know that the Office of Chief Financial Officer is very committed to updating this directive.

Senator INHOFE. Do you have any idea about how long that will take? The criticism the IG had way back in 2005—you have been working on this now for a long period of time—do you have any idea when we might be able to come forward with something that we can start using?

Ms. SVINICKI. I am not certain of the current estimate. Could I provide that for the record?

Senator INHOFE. Let us do that. How about you, Mr. Chairman?

Chairman BURNS. Our CFO passed me a note that basically says the document is complete. They are awaiting completion of the related strategic plan management directive and expect to submit it to the Commission soon.

Senator INHOFE. For the record, all four of you are in support of the change that will be coming forward. That is fine.

Senator Boxer, we agreed we would have an additional 3 minutes. You are recognized.

Senator BOXER. Thank you.

Do you remember, each of you, that you answered the following question with a yes in a very important way? This is the question I am going to ask if each of you remembers you said yes to it.

Do you agree to ensure that testimony, briefings, documents, electronic and other forms of communication are provided to this committee and its staff and other appropriate committees in a timely manner? Do you remember saying yes to that?

Ms. SVINICKI. Yes, I do.

Senator BOXER. Do you, sir?

Mr. OSTENDORFF. Yes, I do.

Senator BOXER. Do you, sir?

Chairman BURNS. Yes.

Senator BOXER. Do you, sir?

Mr. BARAN. Yes.

Senator BOXER. Well, it is not happening and it is awful. You say yes and then you don't come across with the materials. People are waiting for these materials. Senator Markey talked about his request. You said you would sit down and talk to him.

Here is the situation with me. The NRC is still withholding two categories of documents related to the San Onofre investigation. This investigation is important because it has implications for other reactors and the way the NRC enforces its safety requirements.

In fact, it turns out that when Diablo Canyon replaced its steam generators, it also violated the very same safety regulations that were violated at San Onofre. Yet, NRC has not done anything meaningful to learn from its repeated failures to detect noncompliance with its own regulations.

I don't have any confidence that it will and now there is another issue Senator Inhofe raised about when you are getting things done. What is this? You put it in a folder to do sometime? This makes no sense. This is very serious to me because you all looked me in the eye, as you should now, and said that you would turn over this documentation.

Ms. Svinicki, do you remember saying yes? You do. Are you willing to turn over this document which renown constitutional scholar Mort Rosenberg said "NRC's reason for withholding the documents demonstrates a profound misunderstanding of Congress' investigatory power and that they misstate court decisions and ignore case law."

Would you be willing to turn over these documents that I have asked for?

Ms. SVINICKI. Senator Boxer, I have supported our offer to engage with you and your staff on providing information and briefings.

Senator BOXER. I am asking for documents. That is not what you said yes to. You are considered as being sworn when you said that, you know, even if I didn't say do you swear. You are sworn.

I am asking you, will you turn over the documents, yes or no?

Ms. SVINICKI. Senator, I have supported our previous response.

Senator BOXER. OK. That is a no.

Mr. Ostendorff, yes or no, the documents I am requesting?

Mr. OSTENDORFF. Senator Boxer, we have responded on three different occasions in writing based on Commission correspondence to request to meet with your staff and be with you to discuss in detail some of these.

Senator BOXER. I have asked you for documents. It doesn't say do you agree to ensure that you will sit down with a Senator when she asks you for documents. The answer is no.

What about you, Mr. Burns?

Chairman BURNS. Senator, the request on this matter came up before I was here.

Senator BOXER. Before your time.

Chairman BURNS. As I said and I think we have said before, I am committed to work with the committee. In terms of your immediate document request, with all due respect—I said this before in my confirmation hearing—I think there are areas—this may be one where there are issues with respect to provision in certain types of areas.

Senator BOXER. There are words, words, words, words.

Chairman BURNS. The words are, I will commit to work with your staff to see what we can do to make the accommodation to the committee.

Senator BOXER. That is not what you agreed to. You agreed to ensure that testimony, briefings, documents and electronic and other forms of communication are provided to this committee, all members and its staff and other appropriate committees.

I am glad you want to sit down. Great, we will sit. I will sit with all of you. I want the documents.

What about you? Do you have the same answer, that you will sit down with us or are you going to turn over the documents?

Mr. BARAN. The Commission, as a body, would have to decide to do that. My view, which I explained in my confirmation hearing and the last time I was here, is that our default under our internal Commission procedures should be that when a Ranking Member or a Chairman of one of our oversight committees requests documents, we should do everything we can to be responsive.

If there are documents that are particularly sensitive, we need to work with you all and make sure we provide them as soon as possible.

Senator BOXER. Let me say for the record, I know my time has expired and I am so very grateful to you, this is not a partisan matter. We take our roles seriously. It does not say we will—each of you said you would turn over documents. You didn't caveat it. You didn't say, well, it depends on the document and I will sit down with you.

You are in violation of what I consider to be a sacred commitment. I know, because the law says, when you answered this question, it is as if you were under oath. Do any of you want to change the response you gave and just give me a yes.

OK. Then I have to say this entire group of you commissioners, are not fulfilling an oath that you made. It is very disturbing because we have a job to do, whether it is a budgetary job or a safety job. All of your talk here is just that.

I am asking for documents. Yes, we will have you sit down with my counsel and you. We will see where we go but this is distressing.

Thank you.

Senator INHOFE. Thank you, Senator Boxer.

Since you went over, I will only take a few moments. I would ask if you would expand a little further. If you remember my opening questions to you, I observed getting back to Fukushima, two things. One was that we have responded in way and a number of documents have come forth and there have been requests.

The other one I think that is not talked about enough is the fact that Japan was not in the same situation that we were. When I said they were not as prepared for the extreme event as our industry was, in fact the Japanese government report, their report, said the equipment the NRC required—talking about our NRC—following September 11 might have made the difference at Fukushima. That is huge. That is them saying this.

You guys need to be talking about this more because you get a lot of criticism and I think it is unjustified. I think this is pretty good when their report implies if they had done it the way our practices are, that may not have happened. That is very significant.

Do you guys have any response to that? Is there any reason not to be talking about that? I think it is very important.

Chairman BURNS. I might offer this, Mr. Chairman. As I recall when we received the Near Term Task Force report, the Commission did, in 2011, one of the things it noted was the benefits of what we call the B5B improvements, the positioning of equipment

that was done after 9/11 which gave us a significant benefit in terms of safety.

Some of the things we did after that, as I understand, there were inspections done to ensure that equipment was placed. What the industry has done in terms of these regional support centers has enhanced those things.

I think you are right. I think particularly on that issue, what this agency had done and what the industry had done after 9/11 put it in a good place in terms of the overall safety of plants as we look holistically at the lessons learned from Fukushima. My colleagues might have some thoughts also.

Senator INHOFE. Do you have any comments to make about that? The impression I get from a lot of people is we all started at the same place and we did not. Any comments?

Mr. OSTENDORFF. Commissioner Svinicki and I were the two commissioners here after Fukushima. We made a conscious decision by a unanimous Commission vote, five to zero, to not require any U.S. nuclear power plant to shut down because of safety concerns. We did not have those safety concerns.

At the same time, we believed it was appropriate to study and look at where we could make some enhancements. We have done just that.

Our comment with respect to seismic and flooding concerns, I think that was on your part, Senator Inhofe, with respect to the Japan situation, there has been significant work done in this Country in response to the requirement we put down 3 years ago to tell each licensee to submit their flooding and seismic reevaluations at NRC.

That work has been largely completed. Some of it is still under way but there has been a lot of progress in that particular area.

Senator INHOFE. That is good. That is specific and that needs to be said.

How about you, Ms. Svinicki?

Ms. SVINICKI. The equipment that was put in place after the attacks of September 11 made all U.S. nuclear plants inherently more able to respond to extreme events. It was instituted, of course, for a terrorist attack but that same equipment allows a facility to mitigate against an extreme natural disaster.

I think the Japanese report you quoted is acknowledging that U.S. facilities had been through the 9/11 attacks and the equipment provided that capability at U.S. plants.

Senator INHOFE. That needs to be called to the attention of the American people, people who are closely watching this.

Anything else, Senator Boxer?

Senator BOXER. I just want to thank you, Mr. Chairman, very much for this hearing and for continuing the oversight.

I would say I hope to God you are right, that we are much safer, but I will say if you go back to the Japanese statements before this, they were just like yours—we are so safe, we are so safe. Just because we think something, the Japanese really thought they were safe. They are known for their technology and precision. I think we need to move forward.

Thank you for your leadership.

Senator INHOFE. You bet.

I think it would be appropriate to ask unanimous consent the Japanese government report be added to the record in this proceeding today.

[The referenced information follows:]

This Global edition of the Executive Summary is intended solely as a convenience for the non-Japanese-reading global audience, and includes selected elements from the entire Japanese report. Also we have added additional charts (map of Japan, etc.) to make it easier for the global audience to understand. If any questions arise related to the accuracy of the information contained in the translation, please refer to the Japanese-language version of the Commission Report, which is the official version of the document. If there are any discrepancies or differences between the Japanese-language version and this Global edition, the Japanese-language version shall prevail.

The National Diet of Japan

The official report of

The Fukushima Nuclear Accident Independent Investigation Commission

Executive summary

The National Diet of Japan
Fukushima Nuclear Accident Independent Investigation Commission

CHAIRMAN
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Medical Doctor; Academic Fellow, National Graduate Institute for Policy Studies; Former President of the Science Council of Japan

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THE NATIONAL DIET OF JAPAN
FUKUSHIMA NUCLEAR ACCIDENT INDEPENDENT INVESTIGATION COMMISSION
(NAIIC)

To:
MR. TAKAHIRO YOKOMICHI, SPEAKER OF THE HOUSE OF REPRESENTATIVES
MR. KENJI HIRATA, PRESIDENT OF THE HOUSE OF COUNCILLORS
THE NATIONAL DIET OF JAPAN

THE UNPRECEDENTED NUCLEAR ACCIDENT that began on March 11, 2011 is the subject of the following report, which we hereby present to the members of the National Diet of Japan for their review. We do this in accordance with the Act Regarding the Fukushima Nuclear Accident Independent Investigation Commission.

Our investigative task is adjourned today, some six months after the appointment of our Chairman and Members in December of 2011.

This report is meant to reinforce the administrative authority of the legislative body and strengthen oversight activities on issues related to nuclear power. As the first independent commission chartered by the Diet in the history of Japan's constitutional government, we would like to emphasize how important it is that this report be utilized, for the Japanese people and for the people of the world.

CHAIRMAN:

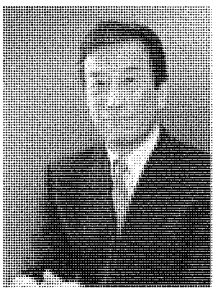
KIYOSHI KUROKAWA

MEMBERS:

KENZO OSHIMA | HISAKO SAKIYAMA | MASAFUMI SAKURAI

YOSHINORI YOKOYAMA | MITSUHIKO TANAKA | KOICHI TANAKA

KATSUHIKO ISHIBASHI | REIKO HACHISUKA | SHUYA NOMURA



Message from the Chairman

THE EARTHQUAKE AND TSUNAMI of March 11, 2011 were natural disasters of a magnitude that shocked the entire world. Although triggered by these cataclysmic events, the subsequent accident at the Fukushima Daiichi Nuclear Power Plant cannot be regarded as a natural disaster. It was a profoundly manmade disaster – that could and should have been foreseen and prevented. And its effects could have been mitigated by a more effective human response.

How could such an accident occur in Japan, a nation that takes such great pride in its global reputation for excellence in engineering and technology? This Commission believes the Japanese people – and the global community – deserve a full, honest and transparent answer to this question.

Our report catalogues a multitude of errors and willful negligence that left the Fukushima plant unprepared for the events of March 11. And it examines serious deficiencies in the response to the accident by TEPCO, regulators and the government.

For all the extensive detail it provides, what this report cannot fully convey – especially to a global audience – is the mindset that supported the negligence behind this disaster.

What must be admitted – very painfully – is that this was a disaster "Made in Japan." Its fundamental causes are to be found in the ingrained conventions of Japanese culture: our reflexive obedience; our reluctance to question authority; our devotion to 'sticking with the program'; our groupism; and our insularity.

Had other Japanese been in the shoes of those who bear responsibility for this accident, the result may well have been the same.

Following the 1970s "oil shocks," Japan accelerated the development of nuclear power in an effort to achieve national energy security. As such, it was embraced as a policy goal by government and business alike, and pursued with the same single-minded determination that drove Japan's postwar economic miracle.

With such a powerful mandate, nuclear power became an unstoppable force, immune to scrutiny by civil society. Its regulation was entrusted to the same government bureaucracy responsible for its promotion. At a time when Japan's self-confidence was soaring, a tightly knit elite with enormous financial resources had diminishing regard for anything 'not invented here.'

This conceit was reinforced by the collective mindset of Japanese bureaucracy, by which the first duty of any individual bureaucrat is to defend the interests of his organization. Carried to an extreme, this led hureaucrats to put organizational interests ahead of their paramount duty to protect public safety.

Only by grasping this mindset can one understand how Japan's nuclear industry managed to avoid absorbing the critical lessons learned from Three Mile Island and Chernobyl; and how it became accepted practice to resist regulatory pressure and cover up small-scale accidents. It was this mindset that led to the disaster at the Fukushima Daiichi Nuclear Plant.

This report singles out numerous individuals and organizations for harsh criticism, but the goal is not—and should not he—to lay blame. The goal must be to learn from this disaster, and reflect deeply on its fundamental causes, in order to ensure that it is never repeated.

Many of the lessons relate to policies and procedures, but the most important is one upon which each and every Japanese citizen should reflect very deeply.

The consequences of negligence at Fukushima stand out as catastrophic, but the mindset that supported it can be found across Japan. In recognizing that fact, each of us should reflect on our responsibility as individuals in a democratic society.

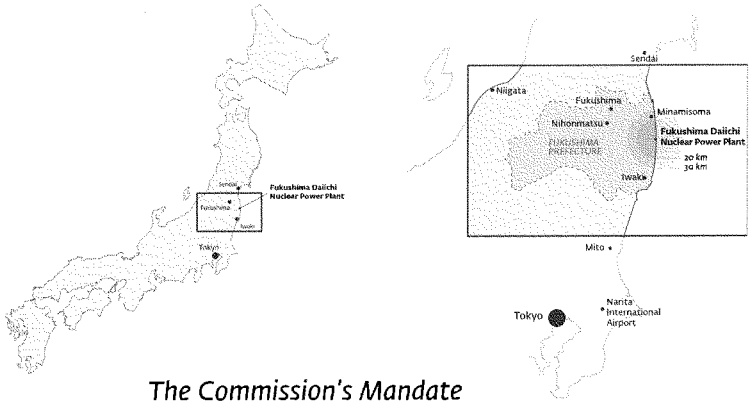
As the first investigative commission to be empowered by the legislature and independent of the bureaucracy, we hope this initiative can contribute to the development of Japan's civil society.

Above all, we have endeavored to produce a report that meets the highest standard of transparency. The people of Fukushima, the people of Japan and the global community deserve nothing less.

CHAIRMAN:

KIYOSHI KUROKAWA

Overview



The Commission's Mandate

On October 30, 2011, the NAIIC Act (officially, the Act regarding Fukushima Nuclear Accident Independent Investigation Commission) was enacted, creating an independent commission to investigate the Fukushima accident with the authority to request documents and request the legislative branch to use its investigative powers to obtain any necessary documents or evidence required. This was the first independent commission created in the history of Japan's constitutional government.

On December 8, 2011, our chairman and nine other members were appointed, and charged by the Speaker and the President of the National Diet with the following mandate, in accordance with Article 10 of the NAIIC Act:

1. To investigate the direct and indirect causes of the Tokyo Electric Power Company Fukushima nuclear power plant accident that occurred on March 11, 2011 in conjunction with the Great East Japan Earthquake.
2. To investigate the direct and indirect causes of the damage sustained from the above accident.
3. To investigate and verify the emergency response to both the accident and the consequential damage; to verify the sequence of events and actions taken; to assess the effectiveness of the emergency response.
4. To investigate the history of decisions and approval processes regarding existing nuclear policies and other related matters.
5. To recommend measures to prevent nuclear accidents and any consequential damage based on the findings of the above investigations. The recommendations shall include assessments of essential nuclear policies and the structure of related administrative organizations.
6. To conduct the necessary administrative functions necessary for carrying out the above activities.

Expectations of the Commission

Before the Commission began its investigation, we also received the following directives from the Joint Council of the Committee on Rules and Administration of Both Houses on the Accident at the Fukushima Nuclear Power Plants of the Tokyo Electric Power Company:

- The investigation is to be conducted thoroughly by experts from a logical, objective and scientific perspective, without bias for or against nuclear power.
- While an open and thorough investigation is the principle, parts of the investigation and the information gathered may be closed to keep the investigation process free of

outside influence.

- A global perspective should be emphasized, so that the results and conclusions will help to prevent nuclear accidents elsewhere.
- The investigation's priority should be on human safety, rather than the structural safety of nuclear reactors.
- The investigation should take place with the understanding that earthquakes and tsunami are still unpredictable but unavoidable events in Japan.
- The investigation should result in recommendations to benefit the nation's future, and provide an opportunity for strengthening the legislative body of the nation.

What we did

Our investigation included more than 900 hours of hearings and interviews with 1,167 people.

We made nine site visits to nuclear power plants including Fukushima Daiichi, Fukushima Daini, Tohoku Electric Power Company Onagawa Nuclear Power Plant, and The Japan Atomic Power Company Tokai Daini Power Plant, in order to conduct as thorough an investigation as possible.

To assure a maximum degree of information disclosure, all 19 of our commission meetings were open to public observation and broadcast on the internet (except for the first one), simultaneously in Japanese and English, to a total of 800,000 viewers. We also used social media, Facebook and twitter to communicate with the public, receiving over 170,000 comments. To gain a global perspective, we dispatched three teams overseas, and included interviews and hearings with experts from the U.S, France, Russia, Ukraine and Belarus.

In addition to this English version of the executive summary, the entire report will soon be published in English.

We focused on the selection of witnesses to those who held responsible positions at the time of the accident in the government, TEPCO and nuclear regulators.

In order to better comprehend the viewpoints of evacuees, we held three town hall meetings, at which we were able to hear first hand the opinions of more than 400 attendees. We also visited twelve municipalities—Futaba, Okuma, Tomioka, Namie, Naraha, Kawauchi, Hirono, Katsurao, Minamisoma, Tamura, Iitate, and Kawamata—within the designated evacuation area, to conduct interviews and survey the residents and workers at the nuclear power plant accident site. We received 10,633 responses to a survey of residents, and many responses from the on-site workers of about 500 related contractors.

What we did not do

There were a number of things we did not do, either because of time constraints or because they did not fit into the scope of our priorities or our mandate.

We did not study matters related to the future energy policies of Japan, including the promotion or abolition of nuclear power.

We did not investigate the treatment and disposition of used nuclear fuel rods.

We did not undertake investigations that would require on-site visits to reactors with dangerous levels of radioactivity.

While we studied the damage compensation and decontamination issues from a systematic perspective, we did not look at specific processes.

We did not address issues related to where responsibility lies in the case of TEPCO being unable to pay accident-related costs.

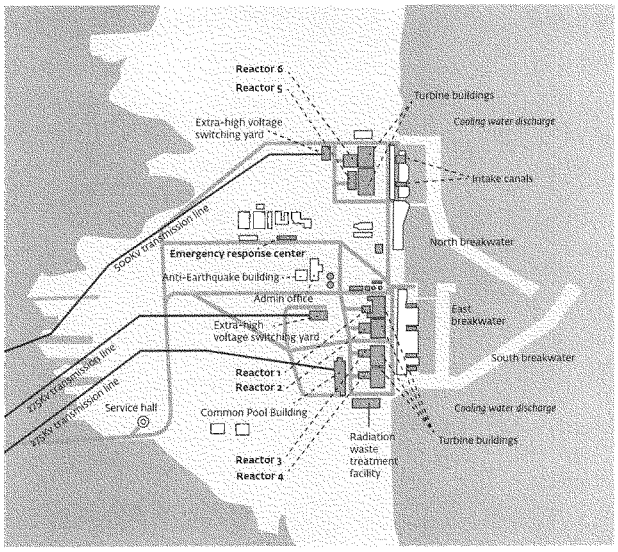
We did not address any stock market-related matters as a consequence of the accident.

We did not address the recommissioning of Japan's nuclear reactors that have halted operations for various reasons.

Nor did we study government administrative policies and regulations that are not related to nuclear safety issues.

We also did not directly investigate the condition of the Fukushima reactors involved in the accident, though we have become aware of the condition from other sources during our investigation. Nor have we attempted to assess the decommissioning methodology of the Fukushima reactors.

And, finally, we have not studied matters relating to the regeneration of the environment surrounding the power plant.



Layout of the Fukushima Daiichi Nuclear Power Plant ▶
Adapted from: INPO "Special Report on the Nuclear Accident at the Fukushima Daiichi Nuclear Power Station"

The accident

On March 11, 2011, the Great East Japan Earthquake triggered an extremely severe nuclear accident at the Fukushima Daiichi Nuclear Power Plant, owned and operated by the Tokyo Electric Power Company (TEPCO). This devastating accident was ultimately declared a Level 7 ("Severe Accident") by the International Nuclear Event Scale (INES).

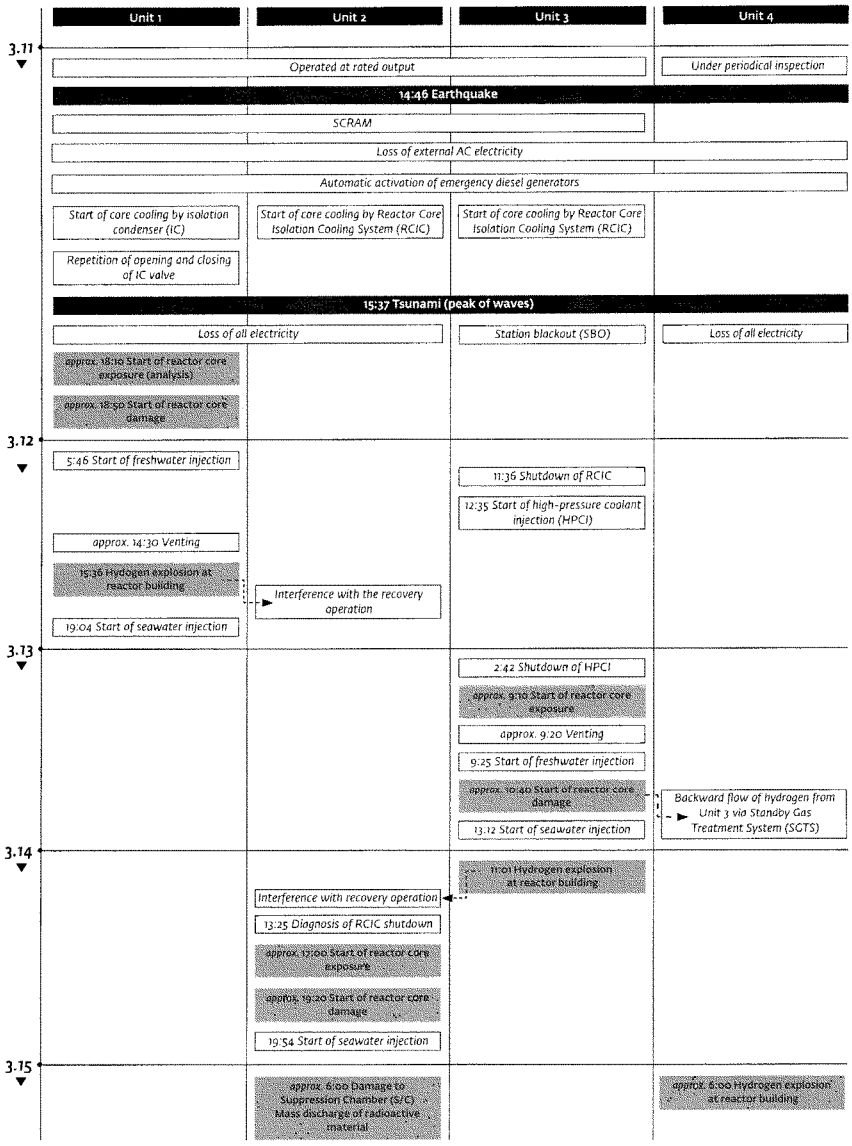
When the earthquake occurred, Unit 1 of the Fukushima Daiichi plant was in normal operation at the rated electricity output according to its specifications; Units 2 and 3 were in operation within the rated heat parameters of their specifications; and Units 4 to 6 were undergoing periodical inspections. The emergency shut-down feature, or SCRAM, went into operation at Units 1, 2 and 3 immediately after the commencement of the seismic activity.

The seismic tremors damaged electricity transmission facilities between the TEPCO Shinfukushima Transformer Substations and the Fukushima Daiichi Nuclear Power Plant, resulting in a total loss of off-site electricity. There was a back-up 66kV transmission line from the transmission network of Tohoku Electric Power Company, but the back-up line failed to feed Unit 1 via a metal-clad type circuit (M/C) of Unit 1 due to mismatched sockets.

The tsunami caused by the earthquake flooded and totally destroyed the emergency diesel generators, the seawater cooling pumps, the electric wiring system and the DC power supply for Units 1, 2 and 4, resulting in loss of all power—except for an external supply to Unit 6 from an air-cooled emergency diesel generator. In short, Units 1, 2 and 4 lost all power; Unit 3 lost all AC power, and later lost DC before dawn of March 13, 2012. Unit 5 lost all AC power.

The tsunami did not damage only the power supply. The tsunami also destroyed or washed away vehicles, heavy machinery, oil tanks, and gravel. It destroyed buildings, equipment installations and other machinery. Seawater from the tsunami inundated the entire building area and even reached the extremely high pressure operating sections of Units 3 and 4, and a supplemental operation common facility (Common Pool Building). After the water retreated, debris from the flooding was scattered all over the plant site,

Timeline following the earthquake and tsunami



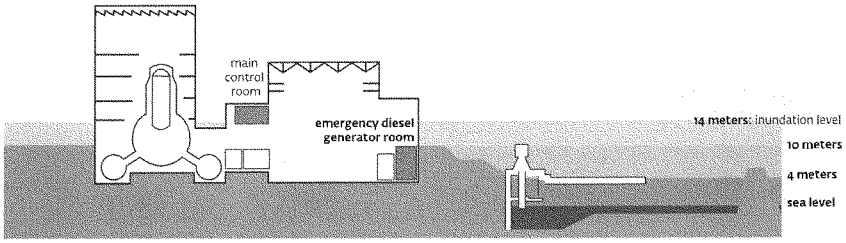
*Start of reactor core exposure and start of reactor core damage times are both from TEPCO's MAAP analysis results.

hindering movement. Manhole and ditch covers had disappeared, leaving gaping holes in the ground. In addition, the earthquake lifted, sank, and collapsed building interiors and pathways, and access to and within the plant site became extremely difficult. Recovery tasks were further interrupted as workers reacted to the intermittent and significant aftershocks and tsunami. The loss of electricity resulted in the sudden loss of monitoring equipment such as scales, meters and the control functions in the central control room. Lighting and communications were also affected. The decisions and responses to the accident had to be made on the spot by operational staff at the site, absent valid tools and manuals.

The loss of electricity made it very difficult to effectively cool down the reactors in a timely manner. Cooling the reactors and observing the results were heavily dependent on electricity for high-pressure water injection, depressurizing the reactor, low pressure water injection, the cooling and depressurizing of the reactor containers and removal of decay heat at the final heat-sink. The lack of access, as previously mentioned, obstructed the delivery of necessities such as alternative water injection using fire trucks, the recovery of electricity supply, the line configuration of the vent and its intermittent operation.

The series of events summarized above are an overview of the severe accident that ultimately emitted an enormous amount of radioactive material into the environment. These are described in detail in the full-length report.

Cross section of the plant showing the inundation level



Conclusions and recommendations

Conclusions

After a six-month investigation, the Commission has concluded the following:

> ***In order to prevent future disasters, fundamental reforms must take place. These reforms must cover both the structure of the electric power industry and the structure of the related government and regulatory agencies as well as the operation processes. They must cover both normal and emergency situations.***

A "manmade" disaster

The TEPCO Fukushima Nuclear Power Plant accident was the result of collusion between the government, the regulators and TEPCO, and the lack of governance by said parties. They effectively betrayed the nation's right to be safe from nuclear accidents. Therefore, we conclude that the accident was clearly "manmade." We believe that the root causes were the organizational and regulatory systems that supported faulty rationales for decisions and actions, rather than issues relating to the competency of any specific individual. (see Recommendation 1)

The direct causes of the accident were all foreseeable prior to March 11, 2011. But the Fukushima Daiichi Nuclear Power Plant was incapable of withstanding the earthquake and tsunami that hit on that day. The operator (TEPCO), the regulatory bodies (NISA and NSC) and the government body promoting the nuclear power industry (METI), all failed to correctly develop the most basic safety requirements—such as assessing the probability of damage, preparing for containing collateral damage from such a disaster, and developing evacuation plans for the public in the case of a serious radiation release.

TEPCO and the Nuclear and Industrial Safety Agency (NISA) were aware of the need for structural reinforcement in order to conform to new guidelines, but rather than demanding their implementation, NISA stated that action should be taken autonomously by the operator. The Commission has discovered that no part of the required reinforcements had been implemented on Units 1 through 3 by the time of the accident. This was the result of tacit consent by NISA for a significant delay by the operators in completing the reinforcement. In addition, although NISA and the operators were aware of the risk of core damage from tsunami, no regulations were created, nor did TEPCO take any protective steps against such an occurrence.

Since 2006, the regulators and TEPCO were aware of the risk that a total outage of electricity at the Fukushima Daiichi plant might occur if a tsunami were to reach the level of the site. They were also aware of the risk of reactor core damage from the loss of seawater pumps in the case of a tsunami larger than assumed in the Japan Society of Civil Engineers estimation. NISA knew that TEPCO had not prepared any measures to lessen or eliminate the risk, but failed to provide specific instructions to remedy the situation.

We found evidence that the regulatory agencies would explicitly ask about the operators' intentions whenever a new regulation was to be implemented. For example, NSC informed the operators that they did not need to consider a possible station blackout (SBO) because the probability was small and other measures were in place. It then asked the operators to write a report that would give the appropriate rationale for why this consideration was unnecessary. It then asked the operators to write a report that would give the appropriate rationale for why this consideration was unnecessary.

The regulators also had a negative attitude toward the importation of new advances in knowledge and technology from overseas. If NISA had passed on to TEPCO measures that were included in the B.5.b subsection of the U.S. security order that followed the 9/11 terrorist action, and if TEPCO had put the measures in place, the accident may have been preventable.

There were many opportunities for taking preventive measures prior to March 11. The accident occurred because TEPCO did not take these measures, and NISA and the Nuclear Safety Commission (NSC) went along. They either intentionally postponed putting safety measures in place, or made decisions based on their organization's self interest, and not in the interest of public safety.

From TEPCO's perspective, new regulations would have interfered with plant operations and weakened their stance in potential lawsuits. That was enough motivation for TEPCO to aggressively oppose new safety regulations and draw out negotiations with regulators via the Federation of Electric Power Companies (FEPC). The regulators should have taken a strong position on behalf of the public, but failed to do so. As they had firmly committed themselves to the idea that nuclear power plants were safe, they were reluctant to actively create new regulations. Further exacerbating the problem was the fact that NISA was created as part of the Ministry of Economy, Trade & Industry (METI), an organization that has been actively promoting nuclear power.

Earthquake damage

We conclude that TEPCO was too quick to cite the tsunami as the cause of the nuclear accident and deny that the earthquake caused any damage. We believe there is a possibility that the earthquake damaged equipment necessary for ensuring safety, and that there is also a possibility that a small-scale LOCA occured in Unit 1. We hope these points will be examined further by a third party. (see Recommendation 7)

Although the two natural disasters—the earthquake and subsequent tsunami—were the direct causes of the accident, there are various points in the unfolding of the event that remain unresolved. The main reason for this is that almost all the equipment directly related to the accident is inside the reactor containers, which are inaccessible and will remain so for many years. A complete examination and full analysis are impossible at this time.

TEPCO was quick, however, to assign the accident cause to the tsunami, and state that the earthquake was not responsible for damage to equipment necessary for safety (although it did add, "to the extent that has been confirmed," a phrase that also appears in TEPCO reports to the government and to the IAEA). However, it is impossible to limit the direct cause of the accident to the tsunami without substantive evidence. The Commission believes that this is an attempt to avoid responsibility by putting all the blame on the unexpected (the tsunami), as they wrote in their midterm report, and not on the more foreseeable earthquake.

Through our investigation, we have verified that the people involved were aware of the risk from both earthquakes and tsunami. Further, the damage to Unit 1 was caused not only by the tsunami but also by the earthquake, a conclusion made after considering the facts that: 1) the largest tremor hit after the automatic shutdown (SCRAM); 2) JNES confirmed the possibility of a small-scale LOCA (loss of coolant accident); 3) the Unit 1 operators were concerned about leakage of coolant from the valve, and 4) the safety relief valve (SR) was not operating.

Additionally, there were two causes for the loss of external power, both earthquake-related: there was no diversity or independence in the earthquake-resistant external power systems, and the Shin-Fukushima transformer station was not earthquake resistant. (See Section 2 of the Summary of Findings)

Evaluation of operational problems

The Commission concludes that there were organizational problems within TEPCO. Had there been a higher level of knowledge, training, and equipment inspection related to severe accidents, and had there been specific instructions given to the on-site workers concerning the state of emergency within the necessary time frame, a more effective accident response would have been possible. (see Recommendation 4)

There were many problems with on-site operations during the accident. Events make it clear that if there are no response measures for a severe accident in place, the steps that can be taken on-site in the event of a station blackout are very limited. Recovery work, such as confirming the operation of the isolation condenser (IC) in Unit 1, should have been conducted swiftly because of the loss of DC power, but was not. TEPCO did not plan measures for the IC operation, and had no manual or training regimens, so these are clearly organizational problems. Regarding the vent line composition, conducting line configuration work in a situation with no power and soaring radiation levels must have been extremely difficult and time consuming. On top of this, sections in the diagrams of the severe accident instruction manual were missing. Workers not only had to work using this flawed manual, but they were pressed for time, and working in the dark with flash-

lights as their only light source. The Kantei's (Prime Minster's Office) distrust of TEPCO management was exacerbated by the slow response, but the actual work being done was extremely difficult.

Many layers of security were breached simultaneously, and the power to four reactors was lost at the same time. Had there not been some coincidental events—such as the RCIC in Unit 2 operating for so many hours, the blow-out panel falling out and releasing pressure, and the speed with which subcontractors cleaned up wreckage—Units 2 and 3 would have been in an even more precarious situation. We have concluded that—given the deficiencies in training and preparation—once the total station blackout occurred, including the loss of a direct power source, it was impossible to change the course of events.

Emergency response issues

The Commission concludes that the situation continued to deteriorate because the crisis management system of the Kantei, the regulators and other responsible agencies did not function correctly. The boundaries defining the roles and responsibilities of the parties involved were problematic, due to their ambiguity. (see Recommendation 2)

The government, the regulators, TEPCO management, and the Kantei lacked the preparation and the mindset to efficiently operate an emergency response to an accident of this scope. None, therefore, were effective in preventing or limiting the consequential damage.

NISA was expected to play the lead role as designated in the Act on Special Measures Concerning Nuclear Emergency Preparedness, which was enacted after a criticality accident at the JCO uranium conversion facility at Tokaimura, Ibaraki Prefecture in 1999. However, NISA was unprepared for a disaster of this scale, and failed in its function.

In the critical period just after the accident, the Kantei did not promptly declare a state of emergency. The regional nuclear emergency response team was meant to be the contact between the Kantei and the operator, responsible for keeping the Kantei informed about the situation on the ground. Instead, the Kantei contacted TEPCO headquarters and the Fukushima site directly, and disrupted the planned chain of command. A TEPCO-Kantei response team was created in TEPCO headquarters on March 15, but this body had no legal authority.

The Kantei, the regulators and TEPCO all understood the need to vent Unit 1. TEPCO had been reporting to NISA, as was the standard protocol, that it was in the process of venting. But there is no confirmation that the venting decision was conveyed to senior members of METI, or to the Kantei. This failure of NISA's function and the scarcity of information at TEPCO headquarters resulted in the Kantei losing faith in TEPCO.

The Prime Minister made his way to the site to direct the workers who were dealing with the damaged core. This unprecedented direct intervention by the Kantei diverted the attention and time of the on-site operational staff and confused the line of command. While TEPCO headquarters was supposed to provide support to the plant, in reality it became subordinate to the Kantei, and ended up simply relaying the Kantei's intentions. This was a result of TEPCO's mindset, which included a reluctance to take responsibility, epitomized by President Shimizu's inability to clearly report to the Kantei the intentions of the operators at the plant.

At the same time, it is hard to conclude that it was the Prime Minister who discouraged the idea of a full pullout by TEPCO, as has been reported elsewhere, for a number of reasons: 1) there is no evidence that the TEPCO management at the plant had even thought of a complete withdrawal; 2) There is no trace of a decision on a complete withdrawal being made at TEPCO headquarters; 3) The evacuation planned before Mr. Shimizu's visit to the Kantei included keeping emergency response members at the plant (though evaculation criteria were discussed); 4) The director-general of NISA reported that when Shimizu called him, he was not asked for advice on a full withdrawal; and 5) The off-site center, which was connected through a video conference system, claimed there was no discussion of a complete withdrawal. Crisis management related to public safety should be assured without having to rely on the capability and judgement of the prime minister of any given time.

Evacuation issues

The Commission concludes that the residents' confusion over the evacuation stemmed from the regulators' negligence and failure over the years to implement adequate mea-

sures against a nuclear disaster, as well as a lack of action by previous governments and regulators focused on crisis management. The crisis management system that existed for the Kantei and the regulators should protect the health and safety of the public, but it failed in this function. (see Recommendation 2)

The central government was not only slow in informing municipal governments about the nuclear power plant accident, but also failed to convey the severity of the accident. Similarly, the speed of information in the evacuation areas varied significantly depending on the distance from the plant. Specifically, only 20 percent of the residents of the town hosting the plant knew about the accident when evacuation from the 3km zone was ordered at 21:23 on the evening of March 11. Most residents within 10km of the plant learned about the accident when the evacuation order was issued at 5:44 on March 12, more than 12 hours after the Article 15 notification—but received no further explanation of the accident or evacuation directions. Many residents had to flee with only the barest necessities and were forced to move multiple times or to areas with high radiation levels. There was great confusion over the evacuation, caused by prolonged shelter-in-place orders and voluntary evacuation orders. Some residents were evacuated to high dosage areas because radiation monitoring information was not provided. Some people evacuated to areas with high levels of radiation and were then neglected, receiving no further evacuation orders until April.

The Commission has verified that there was a lag in upgrading nuclear emergency preparedness and complex disaster countermeasures, and attributes this to regulators' negative attitudes toward revising and improving existing emergency plans.

Continuing public health and welfare issues

The Commission recognizes that the residents in the affected area are still struggling from the effects of the accident. They continue to face grave concerns, including the health effects of radiation exposure, displacement, the dissolution of families, disruption of their lives and lifestyles and the contamination of vast areas of the environment. There is no foreseeable end to the decontamination and restoration activities that are essential for rebuilding communities. The Commission concludes that the government and the regulators are not fully committed to protecting public health and safety; that they have not acted to protect the health of the residents and to restore their welfore. (see Recommendation 3)

Approximately 150,000 people were evacuated in response to the accident. An estimated 167 workers were exposed to more than 100 millisieverts of radiation while dealing with the accident. It is estimated that as much as 1,800 square kilometers of land in Fukushima Prefecture has now been contaminated by a cumulative radiation dose of 5 millisieverts or higher per year. Insufficient evacuation planning led to many residents receiving unnecessary radiation exposure. Others were forced to move multiple times, resulting in increased stress and health risks—including deaths among seriously ill patients.

The government must move to analyze the state of the residents' lives in the affected areas and systematically map out measures to improve their quality of life. These measures should include the realignment of the evacuation zones, the restoration of the foundations of everyday life, decontamination issues, and realigning the medical and welfare systems to meet the public's needs. It has yet to do so. The more than 10,000 people who responded to our surveys, and the comments the Commission Members heard at town hall meetings offer harsh judgment of the government's present stance.

While exposure levels are set as a threshold against acute radiation disorder, there is no widely accepted threshold for long-term radiation damage caused by low doses. The international consensus, however, is that the risk does increase in proportion to the dose. The impact of radiation on health may vary from one person to another depending on age, sensitivity to radiation and other factors, some unknown. After the accident, the government unilaterally announced a benchmark on dosage without giving the specific information that residents needed, including answers to questions like: What is a tolerable level of exposure in light of long-term health effects? How do health implications differ for individuals? How can people protect themselves from radioactive substances?

The government has not seriously undertaken programs to help people understand the situ-

ation well enough to make their own behavioral judgments. They failed to explain, for example, the risks of radiation exposure to different segments of the population, such as infants and youths, expecting mothers, or people particularly susceptible to the effects of radiation.

Reforming the regulators

The Commission has concluded that the safety of nuclear energy in Japan and the public cannot be assured unless the regulators go through an essential transformation process. The entire organization needs to be transformed, not as a formality but in a substantial way. Japan's regulators need to shed the insular attitude of ignoring international safety standards and transform themselves into a globally trusted entity. (see Recommendation 5)

The regulators did not monitor or supervise nuclear safety. The lack of expertise resulted in "regulatory capture," and the postponement of the implementation of relevant regulations. They avoided their direct responsibilities by letting operators apply regulations on a voluntary basis. Their independence from the political arena, the ministries promoting nuclear energy, and the operators was a mockery. They were incapable, and lacked the expertise and the commitment to assure the safety of nuclear power. Moreover, the organization lacked transparency. Without the investigation by this Commission, operating independently of the government, many of the facts revealing the collusion between the regulators and other players might never have been revealed.

Reforming the operator

TEPCO did not fulfil its responsibilities as a private corporation, instead obeying and relying upon the government bureaucracy of METI, the government agency driving nuclear policy. At the same time, through the auspices of the FEPC, it manipulated the cozy relationship with the regulators to take the teeth out of regulations. (see Recommendation 4)

The risk management practices of TEPCO illustrate this. If the risk factors of tsunami are raised, for example, TEPCO would only look at the risk to their own operations, and whether it would result in a suspension of existing reactors or weaken their stance in potential lawsuits. They ignored the potential risk to the public health and welfare. (See Section 5)

Problems with TEPCO's management style, based on the government taking final responsibility, became explicit during the accident. It prioritized the Kantei's intent over that of the technical engineers at the site. TEPCO's behavior was consistently unclear, and the misunderstanding over the "complete withdrawal" from the plant is a good example of the confusion that arose from their behavior. (See Section 3)

After the accident, TEPCO continued to avoid transparency in disclosing information. It limited disclosure to confirmed facts, and failed to disclose information that it felt was uncertain or inconvenient. Some examples of continuing disclosure issues include the delay in releasing electricity demand projections used as the basis for rolling blackouts, and the lack in up-to-date information on the core conditions at the plant.

Reforming laws and regulations

The Commission concludes that it is necessary to realign existing laws and regulations concerning nuclear energy. Mechanisms must be established to ensure that the latest technological findings from international sources are reflected in all existing laws and regulations. (see Recommendation 6)

Laws and regulations related to nuclear energy have only been revised as stopgap measures, based on actual accidents. They have not been seriously and comprehensively reviewed in line with the accident response and safeguarding measures of an international standard. As a result, predictable risks have not been addressed.

The existing regulations primarily are biased toward the promotion of a nuclear energy policy, and not to public safety, health and welfare. The unambiguous responsibility that operators should bear for a nuclear disaster was not specified. There was also no clear guidance about the responsibilities of the related parties in the case of an emergency. The defense-in-depth concept used in other countries has still not been fully considered.

Cosmetic solutions

Replacing people or changing the names of institutions will not solve the problems. Unless these root causes are resolved, preventive measures against future similar accidents will never be complete. (see Recommendations 4, 5 and 6)

The Commission believes the root causes of this accident cannot be resolved and that the people's confidence cannot be recovered as long as this "manmade disaster" is seen as the result of error by a specific individual. The underlying issue is the social structure that results in "regulatory capture," and the organizational, institutional, and legal framework that allows individuals to justify their own actions, hide them when inconvenient, and leave no records in order to avoid responsibility. Across the board, the Commission found ignorance and arrogance unforgivable for anyone or any organization that deals with nuclear power. We found a disregard for global trends and a disregard for public safety. We found a habit of adherence to conditions based on conventional procedures and prior practices, with a priority on avoiding risk to the organization. We found an organization-driven mindset that prioritized benefits to the organization at the expense of the public.

Recommendations

Based on the above findings, the Commission makes the following seven recommendations for the future. We urge the National Diet of Japan to thoroughly debate and deliberate on these recommendations.

Recommendation 1:
Monitoring of the nuclear regulatory body by the National Diet
A permanent committee to deal with issues regarding nuclear power must be established in the National Diet in order to supervise the regulators to secure the safety of the public. Its responsibilities should be:

1. To conduct regular investigations and explanatory hearings of regulatory agencies, academics and stakeholders.
2. To establish an advisory body, including independent experts with a global perspective, to keep the committee's knowledge updated in its dealings with regulators.
3. To continue investigations on other relevant issues.
4. To make regular reports on their activities and the implementation of their recommendations.

Recommendation 2:
Reform the crisis management system
A fundamental reexamination of the crisis management system must be made. The boundaries dividing the responsibilities of the national and local governments and the operators must be made clear. This includes:

1. A reexamination of the crisis management structure of the government. A structure must be established with a consolidated chain of command and the power to deal with emergency situations.
2. National and local governments must bear responsibility for the response to off-site radiation release. They must act with public health and safety as the priority.
3. The operator must assume responsibility for on-site accident response, including the halting of operations, and reactor cooling and containment.

Recommendation 3:
Government responsibility for public health and welfare
Regarding the responsibility to protect public health, the following must be implemented as soon as possible:

1. A system must be established to deal with long-term public health effects, including stress-related illness. Medical diagnosis and treatment should be covered by state funding. Information should be disclosed with public health and safety as the priority, instead of government convenience. This information must be comprehensive, for use by individual residents to make informed decisions.
2. Continued monitoring of hotspots and the spread of radioactive contamination must be undertaken to protect communities and the public. Measures to prevent any potential spread should also be implemented.
3. The government must establish a detailed and transparent program of decontamination and relocation, as well as provide information so that all residents will be knowledgable about their compensation options.

Recommendation 4:
Monitoring the operators
TEPCO must undergo fundamental corporate changes, including strengthening its governance, working towards building an organizational culture which prioritizes safety, changing its stance on information disclosure, and establishing a system which prioritizes the site. In order to prevent the Federation of Electric Power Companies (FEPC) from being used as a route for negotiating with regulatory agencies, new relationships among the electric power companies must also be established—built on safety issues, mutual supervision and transparency.

1. The government must set rules and disclose information regarding its relationship with the operators.

2. Operators must construct a cross-monitoring system to maintain safety standards at the highest global levels.
3. TEPCO must undergo dramatic corporate reform, including governance and risk management and information disclosure—with safety as the sole priority.
4. All operators must accept an agency appointed by the National Diet as a monitoring authority of all aspects of their operations, including risk management, governance and safety standards, with rights to on-site investigations.

Recommendation 5:

Criteria for the new regulatory body

The new regulatory organization must adhere to the following conditions. It must be:

1. Independent: The chain of command, responsible authority and work processes must be: (i) Independent from organizations promoted by the government (ii) Independent from the operators (iii) Independent from politics.
2. Transparent: (i) The decision-making process should exclude the involvement of electric power operator stakeholders. (ii) Disclosure of the decision-making process to the National Diet is a must. (iii) The committee must keep minutes of all other negotiations and meetings with promotional organizations, operators and other political organizations and disclose them to the public. (iv) The National Diet shall make the final selection of the commissioners after receiving third-party advice.
3. Professional: (i) The personnel must meet global standards. Exchange programs with overseas regulatory bodies must be promoted, and interaction and exchange of human resources must be increased. (ii) An advisory organization including knowledgable personnel must be established. (iii) The no-return rule should be applied without exception.
4. Consolidated: The functions of the organizations, especially emergency communications, decision-making and control, should be consolidated.
5. Proactive: The organizations should keep up with the latest knowledge and technology, and undergo continuous reform activities under the supervision of the Diet.

Recommendation 6:

Reforming laws related to nuclear energy

Laws concerning nuclear issues must be thoroughly reformed.

1. Existing laws should be consolidated and rewritten in order to meet global standards of safety, public health and welfare.
2. The roles for operators and all government agencies involved in emergency response activities must be clearly defined.
3. Regular monitoring and updates must be implemented, in order to maintain the highest standards and the highest technological levels of the international nuclear community.
4. New rules must be created that oversee the backfit operations of old reactors, and set criteria to determine whether reactors should be decommissioned.

Recommendation 7:

Develop a system of independent investigation commissions

A system for appointing independent investigation committees, including experts largely from the private sector, must be developed to deal with unresolved issues, including, but not limited to, the decommissioning process of reactors, dealing with spent fuel issues, limiting accident effects and decontamination.

Summary of findings

1

Was the accident preventable?

The Commission has verified that on March 11, 2011, the structure of the Fukushima Daiichi Nuclear Plant was not capable of withstanding the effects of the earthquake and the tsunami. Nor was the Fukushima Daiichi Nuclear Plant prepared to respond to a severe accident. In spite of the fact that TEPCO and the regulators were aware of the risk from such natural disasters, neither had taken steps to put preventive measures in place. It was this lack of preparation that led to the severity of this accident.

The robustness of the Fukushima Daiichi Unit 1

The structure of Fukushima Daiichi Unit 1 was incapable of withstanding the powerful earthquake and massive tsunami of March 11, 2011. The specifications for the plant lacked adequate anti-quake and anti-tsunami yield strengths because: 1) the guidelines for nuclear plant construction were insufficient at the time the construction permit was granted for Units 1 through 3 in the late 1960's, and 2) the area surrounding the plant was considered to have minimal seismic activity and had never experienced earthquake damage. Based on that assessment, a safety tolerance level for the maximum seismic acceleration in the anti-seismic design was set at 265 Gal (Gal is a unit of gravitational acceleration), a remarkably low earthquake resistance.

In 1981, a "Regulatory Guide for Reviewing Seismic Design of Nuclear Power Reactor Facilities" was set by NSC. In 2006, NSC released a revised version of the former guideline. NISA acted to require that nuclear operators assess the anti-seismic safety of their sites according to the new guideline – the so-called "anti-seismic backcheck." In March 2008, TEPCO submitted an interim anti-seismic backcheck report on Unit 5 of Fukushima Daiichi, stating the safety of its anti-seismic measures, and assuming an increased safety tolerance level of the maximum seismic acceleration to 600 Gal. In 2009, NISA accepted the contents of the interim report, even though the scope of the assessment included the reactor building and only seven of many other important safety installations and equipment. In June 2009, similar reports for Units 1 through 4 and 6 were submitted but these were similarly limited.

No further anti-seismic backcheck reports were released by TEPCO, because no significant anti-seismic safety assessments were performed. While the official deadline was June 2009, TEPCO made the decision internally and unilaterally to reschedule the deadline to January 2016. TEPCO learned through the interim report assessment process that many reinforcements were required to meet the standards of the new guideline, but our investigation verified the fact that TEPCO had added no reinforcements to Units 1 through 3 at the time of the March 11 earthquake. Although NISA had recognized the need for both the reinforcements and the backcheck, the regulator failed in its oversight of TEPCO's progress.

In their analysis and evaluation after the accident, both TEPCO and NISA confirmed that some of the important safety parts of piping and supports for Unit 5 were not up to the anti-seismic safety standards at the time of the quake. TEPCO reported that they did not find material damage to these parts in their visual inspection, but the Commission believes that a conclusion denying quake damage cannot be drawn, as inspection, including non-destructive inspection, is not complete. The Commission believes that the same is true for Units 1 through 3, which are much older than Unit 5. Section 2 includes details illustrating the fact that the recorded seismic motion at Fukushima Daiichi exceeded the assumption of the new guideline. It is clear that appropriate anti-seismic reinforcements were not in place at the time of the March 11 earthquake.

The lack of tsunami countermeasures

The construction of the Fukushima Daiichi Plant that began in 1967 was based on the seismological knowledge at that time. As research continued over the years, researchers repeatedly pointed out the high possibility of tsunami levels reaching beyond the assumptions made at the time of construction, as well as the possibility of core damage in the case of such a tsunami. TEPCO overlooked these warnings, and the small margins of safety that existed were far from adequate for such an emergency situation.

Since 2006, the regulatory authorities and TEPCO have shared information on the possibility of a total outage of electricity occurring at Fukushima Daiichi should tsunami levels reach the site. They also shared an awareness of the risk of potential reactor core damage from a breakdown of seawater pumps if the magnitude of a tsunami striking the plant turned out to be greater than the assessment made by the Japan Society of Civil Engineers.

There were at least three background issues concerning the lack of improvements. First, NISA did not disclose any information to the public on their evaluations or their instructions to reconsider the assumptions used in designing the plant's tsunami defenses. Nor did NISA keep any records of the information. As result, third parties could never know of the true state of affairs.

The second issue concerned the methodology used by the Japan Society of Civil Engineers to evaluate the height of the tsunami. Even though the method was decided through

an unclear process, and with the improper involvement of the electric power companies, NISA accepted it as a standard without examining its validity.

A third issue was the arbitrary interpretation and selection of a probability theory. TEPCO tried to justify the belief that there was a low probability of tsunami, and used the results of a biased calculation process as grounds to ignore the need for countermeasures. TEPCO also argued that basing any safety assessment against tsunami on a probabilistic approach would be using a methodology of technical uncertainties, and used that argument to postpone considering countermeasures for tsunami.

As the regulatory agency, NISA was aware of TEPCO's delaying of countermeasures, but did not follow up with any specific instructions or demands. Nor did they properly supervise the backcheck progress.

The reason why TEPCO overlooked the significant risk of a tsunami lies within its risk management mindset—in which the interpretation of issues was often stretched to suit its own agenda. In a sound risk management structure, the management considers and implements countermeasures for risk events that have an undeniable probability, even if details have yet to be scientifically confirmed. Rather than considering the known facts and quickly implementing counter measures, TEPCO resorted to delaying tactics, such as presenting alternative scientific studies and lobbying.

Countermeasures not up to international standards

All of the measures against a severe accident (SA) that were in place in Japan were practically ineffective. The assumptions made in SA countermeasures only included internal issues, such as operational human error, and did not include external factors such as earthquakes and tsunami, even though Japan is known to frequently suffer from these natural events.

From the outset, operators were allowed to set SA countermeasures autonomously. In 1991, the Common Issue Discussion Panel of NSC explicitly stated that "the accident management, including expedient and flexible measures that might be required under actual situations, shall be considered and implemented by the operators based on their 'technical competency' and 'expertise,' but shall not require authority to regulate the specific details of measures."

The severe accident measures that were autonomously set did not even reach the standards of measures set by the regulatory agencies. In fact, the severe accident safety equipment turned out to have a lower yield strength than the safety equipment used during normal operation that met regulated requirements. Clearly, using severe accident safety equipment with lower capability than the equipment used in normal operations undermines the entire reason for developing these measures. As a result of inadequate oversight, the SA countermeasures implemented in Japan were practically ineffective compared to the countermeasures in place abroad, and actions were significantly delayed as a result.

Allowing autonomous SA countermeasures also left room for the operators to actively negotiate terms with the regulators via the Federation of Electric Power Companies (FEPC). This was especially true after 2010, when the regulators began leaning towards regulating SA countermeasures in step with global trends, and the operators, via FEPC, began to aggressively lobby the regulators to slow the process down. The operators negotiated with the regulators for two reasons: 1) to avoid or minimize the risk of potential lawsuits and 2) to avoiding backfitting requirements that would interfere with the operation of existing reactors. Again, this meant that no countermeasures had been prepared against severe accidents like the one that took place beginning on March 11—in other words, an accident that may have very small odds of occurring, but creates a catastrophic situation when it does.

2

Escalation of the accident

The Commission closely investigated the development of the accident. We studied whether the accident could have been contained, and whether it could have become even more serious. We also examined the role of the earthquake as a cause of the accident, and the validity of TEPCO's claim that the tsunami was the sole direct cause.

How the accident developed

The measures in place to prevent a severe accident at the Fukushima Daiichi Nuclear Power plant were far from sufficient. The power supply system was especially poor from a defensive perspective, and suffered from a lack of redundancy, diversity and independence.

Although there were a number of external power lines to the plant, there were only two source stations, and both were put out of commission by the earthquake, resulting in a loss of external power to all the units. The diesel generators and other internal power equipment, including the power distribution buses, were all located within or nearby the plant, and were inundated by the tsunami that struck soon after. The assumptions about a normal station blackout (SBO) did not include the loss of DC power, yet this is exactly what occurred.

In the chaos following the destruction wrought by the tsunami, workers were hindered greatly in their response efforts. The loss of control room functions, lighting and communications, and the struggle to deliver equipment and materials through the debris-strewn plant, were further hindered by continued aftershocks. These also had not been anticipated.

Response manuals with detailed anti-severe accident measures were not up to date, and the diagrams and documents outlining the venting procedures were incomplete or missing. Even emergency drills and training had not been sufficiently prioritized. These were all symptomatic of TEPCO's institutional problems.

Units 1, 3 and 4 exploded, and the containment vessel was breached in Unit 2. Core damage was avoided in Units 5 and 6, which shut down safely. The Commission discovered that, in reality, an even worse situation could have developed at Units 2 and 3, and the situations at Unit 5 and 6 could have easily worsened. If preventive measures against terrorist attacks had been implemented, the accident might have been handled and developed in a different way. Damage to the spent fuel of Unit 4 could have occurred, with greater affect to the wider surrounding environment. There was a distinct potential at the time for this disastrous accident to result in an even more frightening scenario.

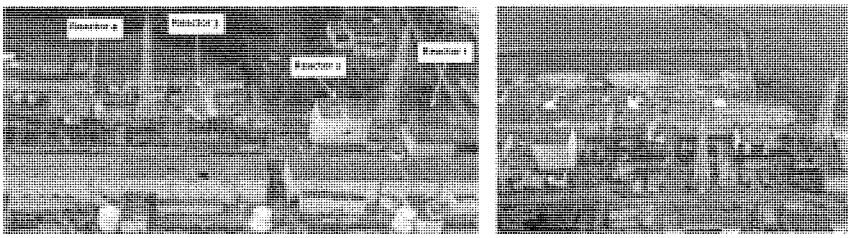
Verification of events

The accident is clearly attributable to the natural phenomena: the earthquake and resulting tsunami. Yet a number of important factors relating to how the accident actually evolved remain unknown, mainly because much of the critical equipment and piping relevant to the accident are inside the reactor containment facility and are thus beyond the reach of inspection or verification for many years to come.

In spite of this, TEPCO specified in its interim investigation report that equipment providing key safety features was not damaged by the earthquake, and that the main cause of the accident was the tsunami. Included in the report was a disclaimer that the report is based on findings "to the extent confirmed." The government also wrote a similar accident report that was submitted to the International Atomic Energy Agency (IAEA).

We conducted our investigations and hearings carefully, conscious of not jumping to conclusions based on preordained policy. The Commission recognizes the need for the regulators and TEPCO to investigate and verify causes of the accident based on the following facts:

1. Strong tremors at the facility began 30 seconds after the SCRAM, and the plant shook hard for more than 50 seconds. That does not mean, however, that the nuclear reactors were incapable of being impacted by the seismic movements. It is thought that the ground motion from the earthquake was strong enough to cause damage to some key safety features, because seismic backchecks against the earthquake design basis and anti-seismic reinforcement had not been done.
2. The reactor pressure and water levels make it obvious that a massive loss of coolant (LOCA) did not occur in the time period between the earthquake and the tsunami. However—as has been published by the Japan Nuclear Energy Safety Organization (JNES) in the "Technical Findings" composed by NISA—a minor LOCA, from a crack in the piping and a subsequent leak of coolant would not affect the water level or pressure of a reactor, and could have occurred without being apparent to operators. If this kind of minor LOCA were to remain uncontrolled for 10 hours, tens of tons of coolant would be lost and lead to core damage or core melt.
3. The government-run investigation committee's interim report, NISA's "Technical Findings," and specifically TEPCO's interim report, all concluded that the loss of emergency AC power—that definitely impacted the progression of the accident—



Views of the reactor buildings following the explosions

"was caused by the flooding from the tsunami." TEPCO's report says the first wave of the tsunami reached the site at 15:27 and the second at 15:35. However, these are the times when the wave gauge set 1.5km offshore detected the waves, not the times of when the tsunami hit the plant. This suggests that at least the loss of emergency power supply A at Unit 1 might not have been caused by flooding. Based on this, some basic questions need to be logically explained before making a final determination that flooding was the cause of the station blackout.

4. Several TEPCO vendor workers who were working on the fourth floor of the nuclear reactor building at Unit 1 at the time of the earthquake witnessed a water leak on the same floor, which houses two large tanks for the isolation condenser (IC) and the piping for IC. The Commission believes that this was not due to water sloshing out of the spent fuel pool on the fifth floor. However, since we cannot go inside the facility and perform an on-site inspection, the source of the water remains unconfirmed.
5. The isolation condensers (A and B systems) of Unit 1 were automatically activated at 14:52, but the operator of Unit 1 manually stopped both IC systems 11 minutes later. TEPCO has consistently maintained that the explanation for the manual suspension was that "it was judged that the per-hour reactor coolant temperature excursion rate could not be kept within 55 degrees (Celsius), which is the benchmark provided by the operational manual." The government-led investigation report, as well as the government's report to IAEA, states the same reason. However, according to several workers involved in the manual suspension of IC who responded to our investigation, they stopped IC to check whether coolant was leaking from IC and other pipes because the reactor pressure was falling rapidly. While the operator's explanations are reasonable and appropriate, TEPCO's explanation is irrational.
6. There is no evidence that the safety relief (SR) valve was opened at Unit 1, though this should have taken place in the case of an accident. (Such records are available for Units 2 and 3.) We found that the sound of the SR valve opening for Unit 2 was heard at the Central Control Room and at Unit 2, but no one working at Unit 1 heard the sound of the Unit 1 SR valve opening. It is therefore a possibility that the SR valve might not have worked in Unit 1. In this case, a minor LOCA caused by the seismic motion could have taken place in Unit 1.

3

Emergency response to the accident

The Commission investigated the accident response of TEPCO, the regulatory agencies, the government and the Kantei (Prime Minister's office)—including the early stages of the response, the development of the accident, the emergency response system and the crisis management system.

TEPCO's accident response

At the time of the accident, neither the Chairman nor the President of TEPCO were present or accessible, an inconceivable situation for an operator of nuclear power plants. The Chairman and the President also had different understandings of the emergency response structure, a fact that very likely contributed to the delay in TEPCO's response to the accident.

TEPCO's manual for emergency response to a severe accident was completely ineffective, and the measures it specified did not function. The manual assumed that reactor readings could be monitored, but failed to account for a prolonged station blackout like the one that occurred at Fukushima, which prevented any monitoring.

The chain of command was disrupted during the emergency. In an accident situation, TEPCO management at the plant was supposed to communicate with the Nuclear and Industrial Safety Agency (NISA) through the off-site Emergency Response Center (ERC), but this was not possible due to the malfunctioning of the off-site center, which was powerless from earthquake damage. The actual on-site situation of the vent in Unit 1 was not communicated to NISA or the Prime Minister's office, which helped create an atmosphere of distrust between TEPCO's on-site management, the regulatory agencies and the Prime Minister's office. The Prime Minister's consequential decision to go to the site and give directions not only took the time of the on-site operators, but caused a disruption in the planned chain of command for the nuclear power company, the regulatory agencies, and the Prime Minister's office. Had the head office of TEPCO actively communicated the on-site situation from the start, and explained the severity of the situation to the other parties, there is a possibility that the distrust—and the confusion in the chain of command that followed—could have been prevented.

Former TEPCO president Masataka Shimizu at the 18th Commission meeting

Neither did TEPCO's head office offer sufficient technical support. As the situation at Unit 2 continued to deteriorate, Masao Yoshida, the general manager of the Fukushima plant, asked CEO and VP Sakae Muto for technical advice, but he was in transit from the off-site center at the time, and was unable to respond. TEPCO's headquarters also failed to protect Yoshida from direct questioning by the Kantei, and approved the instructions of NSC Chairman Madarame, despite being contrary to decisions made at the site, the true front line of the response.

Finally, TEPCO's management mindset of "obedience to authority" hindered their response. The confusion over the "withdrawal" comment by President Shimizu and the intervention by the Kantei arose from this mindset. Rather than make strong decisions and clearly communicating them to the government, TEPCO insinuated what it thought the government wanted and therefore failed to convey the reality on the ground. It is hard to conclude that it was the Prime Minister who discouraged the idea of a full withdrawal, as has been reported elsewhere, for a number of reasons: 1) management at the site never considered a full withdrawal of its workers; 2) there is no evidence that a decision for a full withdrawal was made at the TEPCO head office, 3) the evacuation plan, made before Mr. Shimizu's visit to the Kantei, included keeping emergency response members at the plant; 4) the Director-General of NISA, who Mr. Shimizu contacted, claimed that he was not asked for advice on a full withdrawal; and 5) staff at the off-site center, connected through a video-conference system, claim there was no discussion of a complete withdrawal. It is clear that there was a misunderstanding by the Kantei, but the fundamental cause lies in TEPCO's mindset of deference to and reliance on government authority, and the abdication of their own responsibilities, in spite of its position as a private-sector entity.

The government's emergency response organizations

At the time of the accident, the government's accident response system did not function as planned. The systems that had been planned for use in a disaster—such as the communication and transportation infrastructure–were disabled due to the effects of the tsunami and the earthquake. The failure of the government's accident response system to function in the early stages was one of the reasons that the Kantei increased its involvement in the response to the accident.

The main organizations of the government's accident response system were the Prime Minister's Nuclear Emergency Response Headquarters, the Secretariat of the Nuclear Emergency Response Headquarters of NISA and the Regional Nuclear Emergency Response team. Overall, none of these organizations functioned as planned.

The Prime Minister's Nuclear Emergency Response Headquarters and its Secretariat were intended to lead the overall coordination of emergency response measures, such as

Former prime minister Naoto Kan at the 16th Commission meeting

deciding what measures to take to protect nearby residents, but they were unable to carry out these functions.

Although the intervention of the Kantei contributed to the worsening of the accident, the failure of the Secretariat of the Nuclear Emergency Response Headquarters to gather and share information concerning the development of the accident and the response was a significant factor. Additionally, the Regional Nuclear Emergency Response Team did not take the initiative in the local response to the accident, such as issuing the evacuation order. This was due to the earthquake, the tsunami and the nuclear accident occurring at the same time, and the lack of a prepared response to a prolonged, severe accident.

The Crisis Management Center, located in the Kantei building, already had its hands full with the earthquake and tsunami disaster, and was unable to respond to the nuclear accident. The Nuclear Safety Commission had many problems and was unable to provide advice based on the their own organization's knowledge. The Ministry of Education also failed to make use of the systems that it had prepared.

At a time of rapidly escalating events, it is absolutely vital that every stream of information be shared in real time. Although there was a teleconference system connecting the Kantei and each related organization, there is no evidence that the system was used, especially for sharing information between the Kantei and the related organizations. TEPCO brought its own teleconference system to the off-site center and used it to connect the head office with the plant in Fukushima. Had TEPCO connected its system to the government's teleconference system it may have been able to share information in real time in the early stages, but this was not done.

The Kantei's emergency response

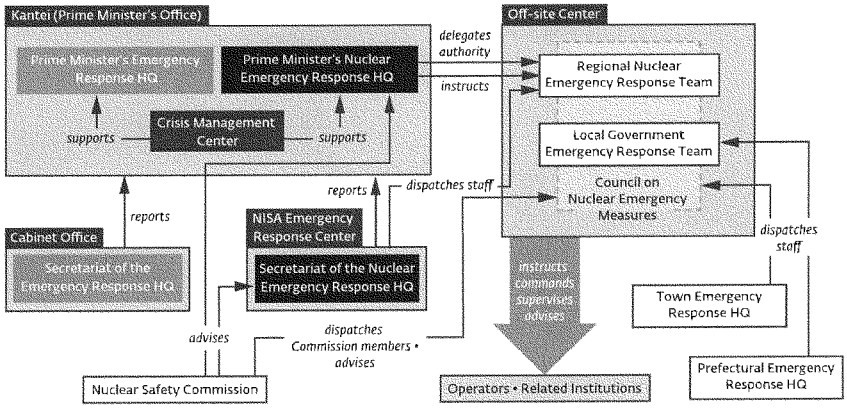
As the situation deteriorated and the planned government accident response systems failed to function, control of the emergency response was taken by the Kantei, with Prime Minister Kan at the center of an ad hoc group of politicians, advisors and the chairman of NISA. This group included people who were neither experts nor had an adequate understanding of the on-site situation.

The Kantei had problems from the start. After being notified by TEPCO that the situation met the conditions of Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness, it took two hours to issue the Declaration of a Nuclear Emergency Situation, a necessary step in launching the emergency response. In fact, Prime Minister Kan was not fully aware that issuing the "Declaration of an Emergency Situation" was a necessary first step in response to the accident, and those around him failed to advise him correctly.

The Kantei group understood that the Crisis Management Center, which was responsible for the initial response, had their hands full dealing with the earthquake and tsunami. The senior members of NISA and NSC had joined the group in order to provide advice. They failed, however, to adequately answer questions, leading to a sense of distrust. This distrust reached its peak at the time of the Unit 1 explosion. From then on, the Prime Minister's office on the fifth floor of the Kantei effectively became the front line of the accident response efforts.

Although TEPCO and the regulators had agreed on how to deal with the vent and the injection of seawater, the Kantei was unaware of this, and intervened, resulting in further disorder and confusion. In the early morning of March 15, feeling a sense of urgency from the lack of information, Prime Minister Kan decided to visit the site himself. In response to TEPCO's bid to "pull out" from the increasingly worsening situation at Unit 2, Prime Minister Kan summoned President Shimizu to his office, where he rejected the withdrawal. Soon afterwards, the government decided to establish a government-TEPCO headquarters structure in the head office of TEPCO.

Throughout the course of this accident, the Prime Minister's office was also central in decisions regarding the evacuation zones. Contingency plans called for the on-site headquarters to have responsibility for drawing up evacuation proposals, with the duty being transferred to the Secretariat of the Nuclear Emergency Response Headquarters in the event that the on-site headquarters was unable to do so. This was exactly the case; but when the response from the Secretariat of the Nuclear Emergency Response Headquarters was delayed, the Kantei stepped in and ordered the evacuations. This resulted in the following problems: 1) as the decisions were made on an ad hoc basis, there was insufficient cooperation between the governmental agencies; 2) there was a deficiency in the details of evacuation



▲ *Diagram of the emergency communication protocol*

operations; and 3) there was a lack of suitable explanation to the public. This led to an increased state of disorder and confusion on the ground.

Evaluating the government and Kantei emergency response

We respect the efforts of the government and other concerned parties considering the extreme conditions in which they found themselves—dealing with the accident, the earthquake and tsunami at the same time under extremely high-pressure conditions. There was little time for a measured approach, and they were required to go without eating or sleeping for long periods of time.

But there are two points which must be stated. First of all, the group at the Kantei did not understand the proper role the Kantei should have taken in a crisis. There has been much attention given to the miscommunication between the Kantei and TEPCO on the issue of whether the withdrawal from the plant that TEPCO planned would be all of the workers or a fraction of them. However, the state of the reactors was so severe that TEPCO had to ask for some kind of retreat. In this situation, the Kantei should have confirmed the possibility that all workers would have to retreat, in order to plan the evacuation of residents and take other measures to protect residents.

It is clear that the Kantei should not have intervened in issues that TEPCO was capable of handling, such as the condition of the vent and the injection of seawater, and should have confirmed the meaning of President Shimizu's comments about the retreat. Its intervention, establishing a government-TEPCO headquarters at TEPCO, is equally unfathomable.

A second point is that the direct intervention by the Kantei, including Prime Minister Kan's visit to the Fukushima Daiichi plant, disrupted the chain of command and brought disorder to an already dire situation at the site. Starting with the Prime Minister's visit to the Fukushima Daiichi plant, a new route was established to communicate information between the Kantei and Fukushima Daiichi and the head office of TEPCO. This new route was contrary to the official information flow from Fukushima Daiichi to the head office of TEPCO and on to NISA and the Kantei (the Prime Minister's Nuclear Emergency Response Headquarters). The new route required TEPCO to communicate its information not only to NISA but also to the Kantei, contributing to the disruption of TEPCO's response and disorder in the plant.

At all times, the government's priority must be its responsibility for public health and welfare. But because the Kantei's attention was focused on the ongoing problems at the plant—which should have been the responsibility of the operator—the government failed in its responsibility to the public. The Kantei's continued intervention in the plant also set the stage for TEPCO to effectively abdicate responsibility for the situation at the plant.

According to the nuclear emergency manual, NISA and the other bureaucratic institutions have the responsibility to collect and organize information for delivery to the Nuclear Emergency Response Headquarters for use in decision-making. However, with the new route in place between the Kantei and TEPCO, the bureaucratic institutions' awareness of their responsibility decreased and their approach became passive. The vertical sectionalism of the various ministries involved also prevented effective information sharing. In order to guarantee public safety, it is necessary for these agencies not only to respond flexibly in times of crisis, but to raise their crisis management capability through a continuous training regimen.

Fukushima Prefecture's accident response

Fukushima Prefecture's emergency response system was also built on the assumption that a nuclear disaster would not occur at the same time as an earthquake and tsunami. As a result, it was totally unprepared to respond to the accident.

The disaster response structure of Fukushima Prefecture was laid out in the Fukushima Prefecture Regional Disaster Prevention Plan, but this did not include the possibility of a nuclear disaster caused by natural disasters. Due to the breakdown in communication from the central government in the post-accident time period, neither the Fukushima prefectural government nor the central government were aware of each other's actions. Feeling a sense of crisis, the Fukushima prefectural government unilaterally ordered that residents within a two-kilometer radius of the plant be evacuated, based on prior emergency prevention training. This was followed 30 minutes later by the central government ordering the evacuation of residents within a three-kilometer radius. However, the earthquake and tsunami had seriously damaged the emergency communication systems, and it was difficult to transmit the order to local municipalities and the public.

Fukushima Prefecture also was unable to conduct emergency monitoring. Only one of the 24 fixed monitoring posts was still working; the others were either washed away or were no longer connected. Mobile monitoring posts were unusable until March 15 due to problems with the mobile telephone network. There was one vehicle equipped with monitoring equipment, but this was also out of action due to a lack of fuel.

Information disclosure by the central government

Detailed accuracy was made a priority, at the expense of quickly getting the information to those who needed it for informed decisions. Mr. Edano, the cabinet secretary, repeatedly stated that there were no immediate health effects from the release of radiation, giving the public a false sense of security. In his statements, however, the necessity and urgency of the evacuations was never adequately explained from the residents' point of view, and the government never followed up with evidence that would support his statements. This caused a great deal of anxiety among the public. Last but not least, the government chose to release information purely from a subjective perspective, rather than reacting to the needs of the public.

4

Spread of the damage

The Commission made a number of findings regarding the spread of damages from the accident at the nuclear plant. We studied how decisions were made, and how the policies and defensive measures were communicated to the public. We also investigated these matters from the perspective of the residents affected by the accident damage.

Damage from the nuclear power plant accident

The effects of the accident, of course, are still being felt, and will continue to affect the country. As a result of the accident, approximately 900PBq of radioactive substances were emitted, 1/6 the amount of emmissions from the Chernobyl accident when converted to iodine. There are now vast stretches of land—1,800 square kilometers—of Fukushima Prefecture with levels equaling a potentially cumulative dose of 5mSv/year or more.

Residents are greatly concerned about their radiation exposure levels. However, the health implications are still unknown because of the different conditions that apply to each individual. An estimate of the cumulative external exposure over the first four months following the accident for approximately 14,000 residents (excluding plant workers) from three towns and villages where radiation doses were relatively high, shows that 0.7 percent of the residents have been exposed to 10mSv or more, and 42.3 percent have been exposed less than 10mSv, of which 57 percent have been exposed to 1mSv or less. While the values are generally low, it is clear that residents are suffering from stress brought on by fear of the unknown.

Chaotic evacuation orders

The Commission's investigation revealed that many residents were unaware that the accident had occured, or of its drastic escalation and the radiation leakage, even after the government and some municipalities were informed.

As the damage from the accident began to escalate, evacuation destinations and other evacuation details were often revised. But, even during the escalation, most nearby residents remained unaware of the accident and its severity, not to mention the potential for increased danger.

A total of 146,520 residents were evacuated as a result of the government's evacuation orders. However, many residents in the plant's vacinity evacuated without accurate information. Unaware of the severity of the accident, they planned to be away only for a few days and evacuated with only the barest necessities. Evacuation orders were repeatedly revised as the evacuation zones expanded from the original 3-kilometer radius to 10 kilometers and later, 20 kilometers, all in one day. Each time the evacuation zone expanded, the residents were required to relocate. Some evacuees were unaware that they had been relocated to sites with high levels of radiation. Hospitals and nursing homes in the 20-kilometer zone struggled to secure evacuation transportation and find accommodations; 60 patients died in March from complications related to the evacuation. Frustration among the residents increased.

On March 15, residents in the zone between 20 and 30 kilometers from the plant were ordered to shelter-in-place. Since the order lasted for several weeks, these residents suffered greatly from a lack of communication and necessities. As a result, the shelter-in-place order was then revised to voluntary evacuation. Again, information on the basis for revising the evacuation order was sadly lacking, and residents found themselves having to make evacuation decisions without the necessary facts. The Commission concludes that the government effectively abandoned their responsibility for public safety.

The fact that some areas within the 30-kilometer zone suffered from high radiation levels was known after the System for Prediction of Environmental Emergency Dose Information (SPEEDI) data was released on March 23. But neither the government nor the nuclear emergency response headquarters made a quick decision to evacuate residents from those areas; it was only one month later that they were evacuated.

Lack of preparation for a nuclear disaster

The regulators had become aware of a number of issues concerning nuclear disaster preparedness prior to the accident, but did not review disaster prevention measures. As a result, delays in taking action contributed to the inappropriate response seen during the accident.

The Nuclear Safety Commission (NSC) started reviewing the disaster-prevention guidelines in 2006 to accommodate new international standards. However, NISA was apprehensive that the residents could become concerned by the necessity of additional defense measures after being repeatedly assured of the safety of nuclear power, and that their worries might spill over to arguments against the plutonium-thermal project then in progress. NSC failed to explain how the civil defense initiative would benefit the residents, and failed to introduce the international standards in a substantial way. Although revision of the disaster-prevention guidelines continued after 2007, the accident broke out as the review was proceeding.

After the Niigata Earthquake in 2007, it was obvious that the assumption of a complex disaster should be included in nuclear accident prevention measures. Still, NISA continued with countermeasures based on assuming a low probability of a complex disaster. NISA eventually only provided passive advice regarding disaster drills based on a complex disaster.

Meanwhile, the government also failed to assume a severe accident or a complex disaster in its comprehensive nuclear disaster drills. As the scope of the drills expanded, they lost substance, and were performed for cosmetic purposes, rather than to develop preparedness. The irrelevant drills were lacking instruction in the necessity of using tools such as the radiation monitoring information from SPEEDI. Though it was applied in the annual drills, participants found the drills useless at the time of the accident.

The Emergency Response Support System (ERSS) and the SPEEDI system are in place to protect public safety. The environment monitoring guideline assumption is that ERSS predicts and forecasts the release of radioactive substances and release data, and SPEEDI predicts and forecasts the spread of radioactive materials based on ERSS. Public safety measures, including those for evacuation, should be planned based on the use of these systems.

If emission data cannot be retrieved from ERSS, the SPEEDI output is not accurate or reliable enough to use in delineating evacuation zones. Some of the people involved were aware of the limitations of the system, but no revisions were made before the accident. There was no other monitoring network in place that could supplement or replace the forecast systems.

The system failed. The emission data could not be retrieved from ERSS, and the government was unable to use the SPEEDI results in planning protection measures and fixing evacuation zones. A few weeks later, NSC released an estimation of the plume of radioactivity at the time of the accident. Though the NSC's estimation was created by reverse analysis based on long-term monitoring data, the public mistakenly believed that it was made with data from the time of the accident which the government had ignored or failed to release. This resulted in further public distrust.

At the same time, the emergency radiation medical systems had been established in a stopgap way, based on problems that arose during the JCO accident in 1999. No one had considered the need for preparation over a wide area of radiation exposure as happened in Fukushima. Because of this, most of the facilities were not used because of their location too close to the plant, their capacity, and the number of trained medical personnel. Those medical institutions with capacity for emergency radiation treatment did not function as anticipated.

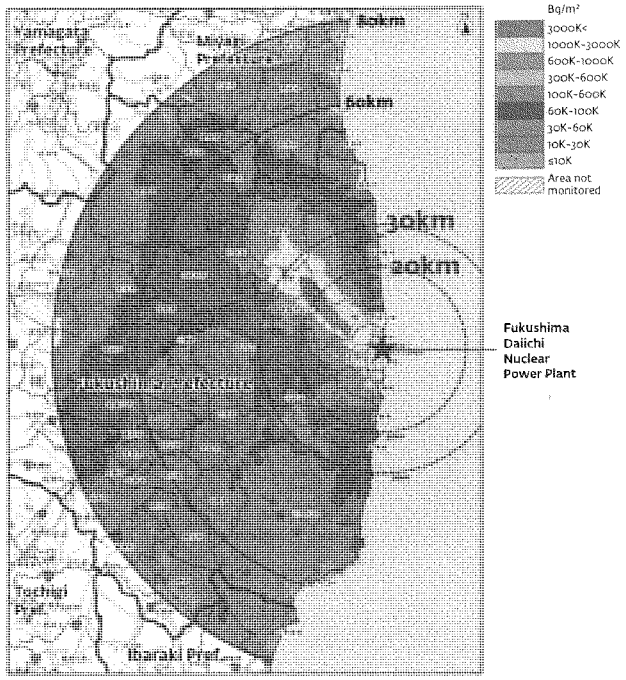
Current and future health damage from radiation

One of the biggest concerns among residents is the impact of radiation on their health. Nevertheless, the government and Fukushima Prefecture have yet to make a proper response to the pressing concerns of residents regarding radiation doses in their neighborhood, its impact on their health, and other radiation issues. What the government needs to do is convey detailed information to the residents and provide options for informed decision-making.

There is no consensus among experts on the health effects of low dose radiation exposure, but we agree that the limits should be set as low as can he reasonably achieved. The government needs to make efforts to explain the need for limits, and the levels decided, in ways that are clear and understandable to ordinary citizens. The government has not seriously undertaken programs to help people understand the situation well enough to make their own informed decisions. The government did not, for example, clearly explain the variations in the risk of radiation exposure to different segments of the population, such as infants and youths, expectant mothers, or others more susceptible to the effects of radiation.

Much was learned from the Chernobyl accident about low dose radiation exposure, including the risk of thyroid cancer among children. Although the positive effects of administering stable iodine and the proper timing were fully known, the government's nuclear emergency response headquarters and the prefectural government failed to give proper instructions to the public.

Appropriate control of the public's internal exposure is important for managing health over the mid- and long-term. Although standards have been categorized in detail, it is more important that the government communicates in ways that are clearly helpful to the public: identifying what is edible, what is the tolerable intake level, which foods continue to be safe, and whether tests are reliable. Through thorough inspection and transparent disclosure



Map showing accumulated cesium-137 ▶
From data collected by MEXT on July 2, 2011

of information, the government should efficiently address public concerns. Neither the government nor Fukushima Prefecture have prepared plans to accumulate data on internal exposure to radioactive cesium.

TEPCO did not prepare worker safety measures in the case of a severe accident, and information on environmental dosage was not provided to them immediately after the accident. It is important that nuclear power plant workers' exposure be controlled properly, and securing the safety of workers during the accident response is critical.

At the same time, radiation exposure is not the only health issue. People in Fukushima are suffering from mental health issues, which evolved into a serious social problem among those affected by the Chernobyl accident. The Commission places the mental and physical health of the residents as the first priority, and concludes that action needs to be taken urgently. Surveys that monitor the health conditions of residents of Fukushima are necessary, but an adequate inspection system with inspection equipment is urgently needed. Measures need to be taken with a priority on public health. Unfortunately, we see few signs of anything being done.

Prolonged environmental and decontamination issues

Once radioactive substances are released, they continue to affect the environment, and must be effectively dealt with. Of all the issues from the accident, the Commission considers the problem of environmental pollution to be the least addressed. As is apparent from the Chernobyl accident, radioactive fallout that spread over a broad area remains in mountain and forest areas for many years, and their levels do not naturally diminish for many decades. Wildfires, floods and other causes can spread contamination further.

Rainfall flushes radioactive materials and creates relatively high dose locations

("hotspots"), in areas such as lakes. Highly contaminated deposits also tend to collect on the seabed. The government should address these problems promptly with a long-term view toward rectifying the situation.

The government is spending massive amounts of financing and energy on decontamination programs, but major issues have arisen regarding the implementation. Many regions have been unable to secure temporary storage sites for the contaminated debris, a problem exacerbated by the government's unilateral action in pushing decontamination without first gaining consent from the residents. It has been proven that the better the communication between the residents and the municipal governments, the more success the community has in securing temporary debris storage sites.

The Commission recognizes that the residents also have different decontamination agendas depending on the region, and consideration needs to be given to their demands. Some want to remain in their homeland and actively support decontamination; others want to move away and are requesting compensation to support their relocation. Many residents have a choice and, in these cases, the government must help them make informed decisions.

It is time to begin monitoring decontamination cost effectiveness and its effect on the environment, as well as the methods used in the decontamination process. Without in-depth analysis, the major concerns of the residents will remain unanswered: Can they return home? If yes, when? If they return, will they be able to support themselves?

Decontamination should not be treated as a unilateral decision, but must be categorized according to its effect. It must be remembered that at the root of residents' questions is not decontamination, but whether they can reconstruct their former lives. The government must continue the decontamination process while revising the plans to reflect the experiences gained.

5

Organizational issues in accident prevention and response

The Commission found a number of organizational issues regarding preventive measures prior to the accident, the causes of the accident and the crisis management response after the accident. We investigated the entire chain of events in order to discover what went wrong with the organizations and systems involved. We also examined the relationship between TEPCO and the regulatory agencies with a view to reform in the future.

Background issues

There were many opportunities for NISA, NSC and TEPCO to take measures that would have prevented the accident, but they did not do so. They either intentionally postponed putting safety measures in place, or made decisions based on their organization's self interest—not in the interest of public safety.

Following the implementation of new regulations in other countries, discussions were held about revising the guidelines to include a scenario where the AC power source was lost. The discussion also included reviewing the reliability of existing DC power sources. Unfortunately, these talks did not result in any revision to the guideline or the regulations, and at the time of the accident no serious consideration had been given to a scenario involving loss of AC power to the plant.

Both TEPCO and NISA were aware that if tsunami levels rose beyond the assumptions made by the Society of Civil Engineers, there was a risk of core damage from a malfunction of the seawater pumps. They were also aware that a tsunami with water levels above the ground level of the power plant was a possibility, and would result in a total loss of power.

Despite the fact that both TEPCO and NISA were aware of the risks, no attempts were made to amend the existing regulations or bring them in line with international standards. NISA gave no compulsory instructions to carry out specific measures, and TEPCO took no action.

NISA did instruct TEPCO to conduct an anti-seismic backcheck, but by not completing the backcheck as originally scheduled, TEPCO effectively invited the accident that followed. NISA is equally at fault because it did not ensure that the backcheck was completed in a timely fashion, despite its awareness of the backcheck's importance. NISA's failure to demand action, and TEPCO's failure to act, together constitute negligence which led to the accident. They cannot use the excuse of circumstances occurring that were beyond their expectations.

The "regulatory capture" of Japan's nuclear industry

The fundamental causes of the accident, including the failure to carry out earthquake and tsunami measures and the lack of measures for dealing with a severe accident, can be also traced to the Federation of Electric Power Companies (FEPC). This is an unregulated lobbying association of electric power companies, and thus also bears a share of the responsibility.

Despite the fact that constant vigilance is needed to keep up with evolving international standards on earthquake safeguards, Japan's electric power operators have repeatedly and stubbornly refused to evaluate and update existing regulations, including backchecks and backfitting. The Japanese nuclear industry has fallen behind the global standard of earthquake and tsunami preparedness, and failed to reduce the risk of severe accidents by adhering to the five layers of the defense-in-depth strategy.

The Commission's examination of the way safety regulations are deliberated and amended reveals a cozy relationship between the operators, the regulators and academic scholars that can only be described as totally inappropriate. In essence, the regulators and the operators prioritized the interests of their organizations over the public's safety, and decided that Japanese nuclear power plant reactor operations "will not be stopped."

Because the regulators and operators have consistently and loudly maintained that "the safety of nuclear power is guaranteed," they had a mutual interest in averting the risk of existing reactors being shut down due to safety issues, or of lawsuits filed by anti-nuclear activists. They repeatedly avoided, compromised or postponed any course of action, and any regulation or finding that threatened the continued operation of nuclear reactors. The FEPC has been the main organization through which this intransigent position was maintained among the regulatory agencies and in the academic world.

Our investigation focused on the significant lobbying role taken by FEPC on behalf of the operators, and scrutinized the relationship between the operators and regulators. The Commission found that the actual relationship lacked independence and transparency, and was far from being a "safety culture." In fact, it was a typical example of "regulatory capture," in which the oversight of the industry by regulators effectively ceases. We found examples of this in the neutering of revisions in the Guideline for Anti-seismic Design, and the improper discussions that took place on regulating severe accident countermeasures.

TEPCO's organizational issues

Again, we must point to TEPCO's organizational mindset as one cause of the accident: on

one hand they strongly influenced energy policy and nuclear regulations while abdicating their own responsibilities and letting METI take the responsibility on the front line. But they also manipulated the cozy relationship with the regulators to take the teeth out of rules and regulations.

TEPCO did hold meetings about what it viewed as risks to nuclear power production; such risks were defined as the potential loss of trust in the utility on the part of the public regarding natural disasters and possible decreases in the operation rates of reactors. The risk of a potentially severe accident never appeared in TEPCO's list of risks. TEPCO explained this glaring omission by arguing that nuclear safety was supposed to be dealt with by its on-site plant department, hence such risks were not to be recorded in the records of the central risk management meetings. The risk of damage to public health and welfare was not an issue for TEPCO.

As the nuclear power business became less profitable over the years, TEPCO's management began to put more emphasis on cost cutting and increasing Japan's reliance on nuclear power. While giving lip service to a policy of "safety first," in actuality, safety suffered at the expense of other management priorities. An emblematic example is the fact that TEPCO did not have the proper diagrams of piping and other instruments at the Daiichi plant. The absence of the proper diagrams was one of the factors that led to a delay in venting at a crucial time during the accident.

After the accident, TEPCO had the twin responsibilities of containing the accident situation and disclosing facts regarding the status of the accident to the surrounding residents, the nation and the international community in an appropriate and timely manner. We assert that the actual disclosure of facts by TEPCO was inappropriate, and that such inappropriateness was also an indirect cause of the deterioration of the situation. For example, regarding the disclosure of an increase of reactor vessel pressure at Unit 2, TEPCO issued a press release about seawater injection at 23:00 on March 14, but made no disclosure about an increase in radiation dosage at the entrance of the plant that occurred between 19:00 and 21:00 on the same day. TEPCO also downplayed the severity of the situation in their disclosure regarding the plague in the suppression chamber of Unit 2; moreover, there was a significant delay from when TEPCO informed the Kantei and when it disclosed the information publicly.

The Commission also found a record by TEPCO noting that they did not inform the public of an increase in reactor vessel pressure at Unit 3, as of 8:00 on March 14, because NISA had banned the release. In fact, the Kantei had merely instructed TEPCO to inform them of the contents of releases when they were made. In obeying NISA's order to halt the release of this crucial information, TEPCO effectively prioritized its own interests and those of NISA over the greater good of the public and their right to be informed.

Organizational issues concerning regulatory bodies

Prior to the accident, the regulatory bodies lacked an organizational culture that prioritized public safety over their own institutional wellbeing, and the correct mindset necessary for governance and oversight. The Commission concludes that the structural flaws in Japan's nuclear administration must be identified through a critical investigation into the organizational structures, laws and regulations and personnel involved. We should identify the areas in need of improvement, recognize the lessons to be learned, and plot the fundamental reforms necessary to ensure nuclear safety in the future.

Autonomy and transparency must be built into the new regulatory organizations to be created. They must have significant powers of oversight in order to properly monitor the operators of nuclear power plants. New personnel with highly professional expertise must be employed and trained. It is necessary to adopt drastic changes to achieve a properly functioning "open system." The incestuous relationships that existed between regulators and business entities must not be allowed to develop again. To ensure that Japan's safety and regulatory systems keep pace with evolving international standards, it is necessary to do away with the old attitudes that were complicit in the accident that occurred.

6

The legal system

The Commission investigated the need for the fundamental reform of laws and regulations governing nuclear power. It outlined the need to prepare an organizational structure that would assure sound decision-making processes for the implementation of nuclear laws and regulations.

Laws and regulations governing nuclear power

The Commission has found that prior to the accident, revision and amendments of laws and regulations were only undertaken on a "patchwork" basis, in response to micro-concerns. The will to make large, significant changes in order to keep in step with the standards of the international community was utterly lacking.

At the time of the accident, the laws, regulations and infrastructure were based on the assumption that the scope and magnitude of possible natural disasters would not exceed precedent. There was a failure to take into account the prospect of unprecedented events such as the earthquake and tsunami on March 11, 2011, despite the fact that the possibility of such events was known.

Those in charge of the laws and regulations that governed the nuclear power industry in Japan had a dogmatic mindset that failed to keep pace with evolving international laws, standards and practices, and which disregarded pertinent technological advice and improvements from abroad. As a result, the laws and regulations governing Japan's nuclear power industry at the time of the accident were outdated relative to those of other countries and, in some cases, obsolete.

Prior to the accident, the primary purpose of the nuclear laws and regulations was the promotion of nuclear energy. The laws need to be rewritten with emphasis placed on prioritizing public safety, health and welfare. The roles, responsibilities and relationships of the operators, regulators and other involved entities need to be clearly delineated in the Act on Special Measures Concerning Nuclear Emergency Preparedness. The defense-in-depth needs to be formally enshrined in the regulations so that it will function properly when needed in the future.

The accident has highlighted the need for sweeping, fundamental reform of said laws and regulations to bring them into line with international standards, make use of cutting-edge technical knowledge and learn from other accidents around the world. It is necessary to create a system wherein regulators have an ongoing obligation to insure that the laws and regulations reflect changing international standards. A mechanism for monitoring the resulting infrastructural implementations must be devised.

Once such new systems, laws and regulations are established, they must then be retroactively applied to existing reactors. It should be explicitly stated in the laws that reactors that do not meet the new standards should be decommissioned or otherwise dealt with appropriately.

Appendices

These survey results are based on the data announced at the 19th Commission meeting on June 9, 2012

Survey of the evacuees from the Fukushima nuclear power plant accident

The survey drew 10,633 responses, a reply rate of approximately 50 percent. Of these, 8,073 respondents provided comments in the free comment space. Furthermore, 431 respondents wrote on both the front and back of the survey sheet and/or provided further comments on separate papers, expressing their strong will to be heard.

1. ***Delay by the government in communicating information about the accident led to confusion thereafter.***
2. ***Because instructions for evacuation were made on an ad hoc basis, many people were evacuated multiple times, evacuated to areas with high radiation, and evacuated with only the barest necessities.***
3. ***Messages of agony borne by the evacuees were delivered to us. The issues are not yet resolved. Proper measures should be considered as soon as possible.***

Communication of information on the accident

- Awareness of the accident was extremely low among residents, despite releases of information according to Article 10 at 15:42 on March 11, a report according to Article 15 at 16:45, and declaration of state of emergency at 19:03.
- There were significant differences in the speed of transmission of accident information to the evacuation areas, depending on the distance from the plant.
- Municipalities and the police served as the sources of accident information for 40% of residents of Futaba and Naraha, but only for 10% of residents of Minamisoma, Iitate, and Kawamata.

Evacuation order

- Residents were informed of the accident a few hours after it occurred, but they did not receive any information about the situation or the accident, or information that would be useful for their evacuation. As a result, many residents were only able to leave with the bare necessities.

Voluntary evacuations

- Inside the 30km radius area, the shelter-in-place order was issued at 11:00 on March 15, and the call for voluntary evacuations was issued on March 25. However, as the government was slow in issuing instructions, many residents evacuated on a voluntary basis.
- Although it was clear that there were high radiation levels in Iitate and Kawamata, the planned evacuations were late. The government may have been late in deciding the designation of the evacuation zones of areas with high radiation levels.

Evacuations to areas with high radiation levels

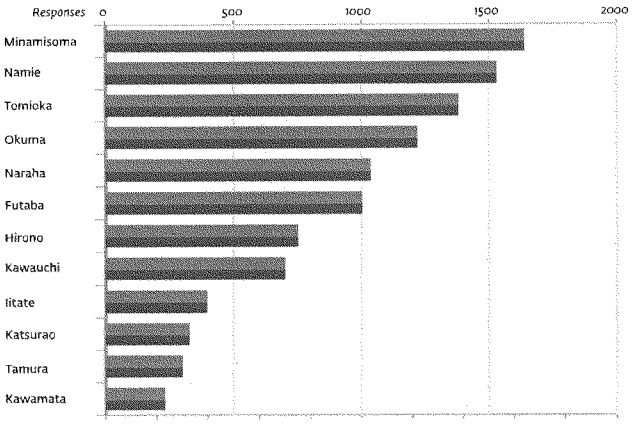
- Approximately 50 percent of the residents of Namie temporarily evacuated to areas with high concentrations of radiation.
- The government was slow in disclosing monitoring information.

Expansion of evacuation zones and the phased evacuation

- Through more than four evacuations, over 70 percent of residents from the areas near the Fukushima Daiichi and Fukushima Dai-ni plants (Futaba, Okuma, Tomioka, Naraha, Namie) evacuated.
- There were numerous complaints about evacuation orders that required the residents living nearest the nuclear plants to evacuate so many times.

Accident precautions

- Even at the plant itself, there was little explanation of the possibility of a nuclear accident. Less than 15 percent of residents reported receiving evacuation training for a nuclear disaster and less than 10 percent of residents reported receiving explanations about the possibility of a nuclear accident.



◂ *Number of Replies by Municipalities*

Survey results

- This survey was sent to citizens who were forced to evacuate as a result of this accident.
- *Objective:* To grasp the reality of how the evacuation was ordered and how the risks of nuclear power were explained
- *Method:* Postal survey
- *Duration:* March 15 to April 11, 2012
- *Targeted respondents:* 21,000 randomly selected households in 12 cities, towns and villages (55,000 households) in the evacuation zones
- *Surveyed cities and villages:* Futaba, Okuma, Tomioka, Naraha, Namie, Hirono, Tamura Minamisoma, Kawauchi, Katsurao, Kawamata, Iitate.
- *Total Respondents:* 10,633
- The Commission would like to express its gratitude to the many people who cooperated with this survey. The response rate was extremely high—50 percent.
- Of the 10,633 respondents, 8,073 (76%) provided comments in the free comment space. Furthermore, 431 respondents (4%) wrote on both the front and back of the survey sheet and provided further comments on separate papers, expressing their strong will to be heard.

Delay in information communication

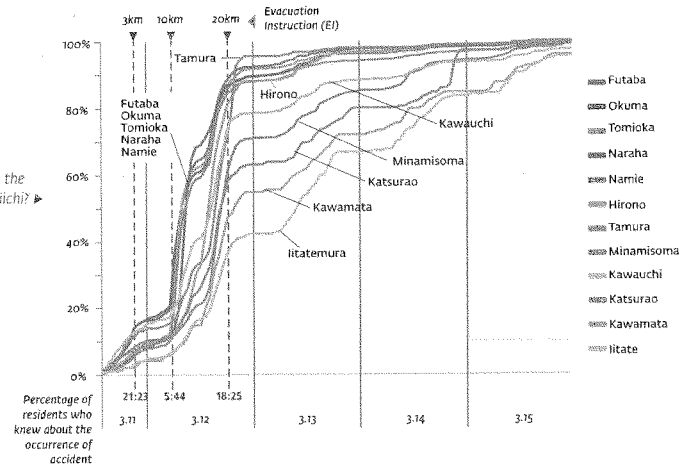
- Awareness of the accident was extremely low among evacuated residents, despite releases of information according to Article 10 at 15:42 on March 11, a report according to Article 15 at 16:45, and declaration of state of emergency at 19:03.
- There were significant differences in the speed of transmission of accident information to the evacuation areas.
- Municipalities, the emergency radio system, or the police served as the sources of accident information for 40% of residents of Futabamachi and Narahamachi, but only for 10% of residents of Minamisoma, Iitate, and Kawamata.

Time of the evacuation order and source of information

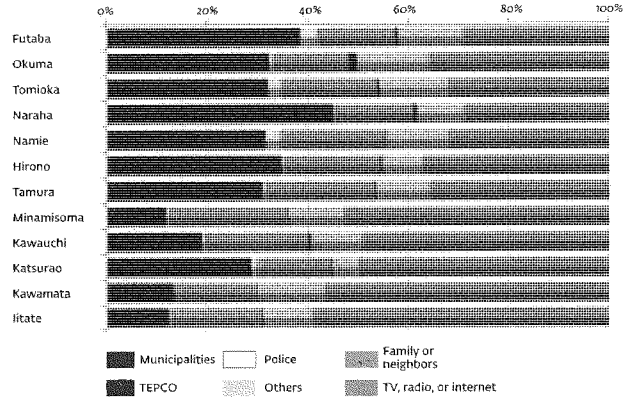
- Within a few hours after the evacuation order was issued, the municipalities communicated the evacuation order to residents, showing that there was a high level of communication between the municipal governments and residents.

  However, as there were areas in which the municipalities did not receive evacuation orders from the government, there were major problems in the transmission process of the evacuation order from the government to the municipalities.
- Residents were given the evacuation order, but they did not receive information about

When did you know about the accident at Fukushima Daiichi? ▶



Source of Information About the Accident ▶

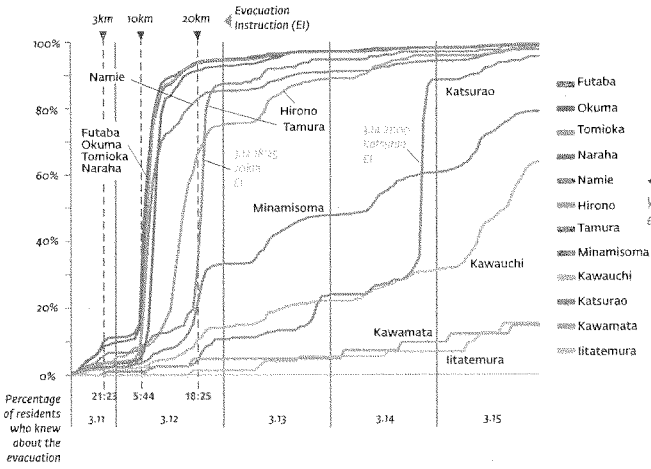


the situation or the accident that would be useful for their evacuation. As a result, many residents left with only the bare necessities.

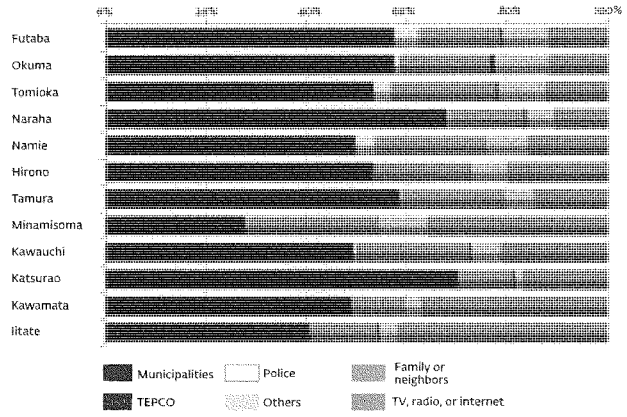
- Many residents received information from the municipalities.
- A high percentage of residents of Minamisoma, Kawamata and Iitate received information from TV, radio or the internet.

(i) Comment by a resident of Futaba:

"I left my house with only the bare necessities. I learned where to go through the emergency radio system while I was on the road. I arrived at the first evacuation site where I was instructed to go, taking 6 hours by car instead of only 1 hour in an ordinary situation. On my way there, my son who lives away called and told me that I should not expect to return soon. Only then did I start to recognize little by little what was



◂ *When did you learn that your residential area was an evacuation zone?*



◂ *Source of Information About the Evacuation Instruction*

actually happening. That is what I recall. Can you think what life is like when you are displaced and separated from your friends and people you know?"

(ii) Comment by a resident of Okuma:

"If there had been even a word about a nuclear power plant when the evacuation was ordered, we could have reacted reasonably, taken our valuables with us or locked up the house before we had left. We had to run with nothing but the clothes we were wearing. It is such a disappointment every time we are briefly allowed to return home only to find out that we have been robbed again."

(iii) Comment by a resident of Tomioka:

"We wanted to hear clearly that we would not be able to return for awhile. I couldn't bring

my valuables with me. In particular, because records of medical treatment were left at home, my parents' conditions worsened during evacuation. It is hard especially for elderly people to flee unprepared. I have no attachment to Tomioka because we were only renting the house, but if we cannot live in the temporary housing forever, we will lose a place to live permanently. There are other problems, too. So I want to be on welfare support again. It was not staff from the prefectural government or the town hall who were there to guide us during the evacuation, it was the medical service workers who were usually seeing my father. It took half a day to figure out where he was taken. It took too long to create a roster of evacuees."

(iv) Comment by a resident of Namie:

"I managed to spend a night in an elementary school in Tsushima district after hearing an announcement in the town gymnasium in the morning of March 12 that a tsunami had approached Namie-Higashi Junior High School, instead of being told of the accident at the nuclear power plant. If I had been told specifically about the accident, I would have evacuated to somewhere further than Tsushima. It is disappointing that information was not given."

(v) Comment by a resident of Minamisoma's Odaka ward:

"We didn't know there was a hydrogen explosion at the plant, so we couldn't guess why we had to evacuate. The director (of TEPCO) at the time of the accident recalled on TV that he thought he might die at the time, but that sort of information should have been announced to the nearby residents instantly. In any event, information was released too slowly. The residents have not been treated properly."

Time of evacuation

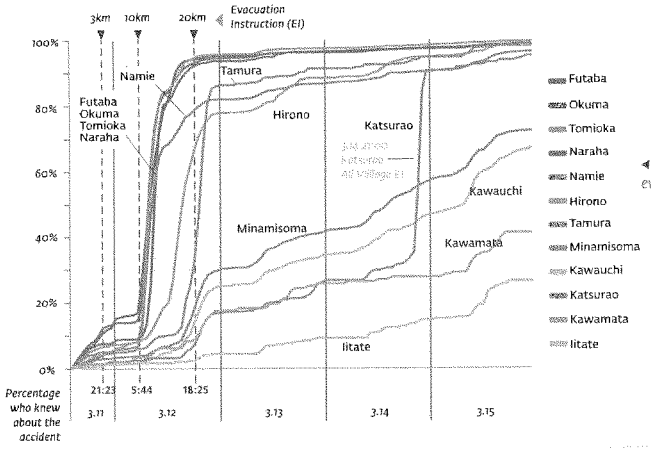
- A few hours after the evacuation order was issued, most of the residents (80-90%) in the evacuation zones started to evacuate.
- In the 30km area surrounding the nuclear power plant residents had no choice but to evacuate voluntarily. Even though a high level of radiation was observed in Kawamata and Iitate, designation of the planned evacuation area was delayed.
- Inside the 30km radius area, the shelter-in-place order was issued at 11:00 on March 15, and the call for voluntary evacuations was issued on March 25. However, as the government was slow in issuing instructions, many residents evacuated on a voluntary basis.
- Although it was clear that there were high radiation levels in Iitate and Kawamata, the planned evacuations were late. The government may have been late in deciding the designation of the evacuation zones of areas with high radiation levels.
- In the space for comments, some residents from these areas expressed criticism that the government was slow in issuing the evacuation order or even that the government did not issue the order for their area.

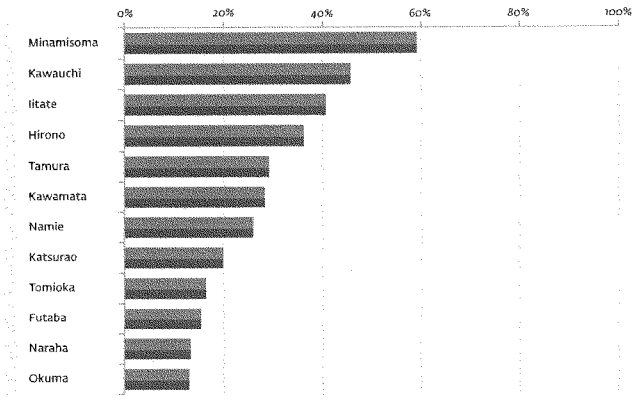
(i) Comment by a resident of Minamisoma

"In Haramachi in Minamisoma, we were told to 'stay at home,' and were never once told to evacuate. On TV, all they said was 'there are no immediate health effects,' making us even more afraid. Nothing has changed since the accident occurred. When there is very little progress in decontamination, it is too strange that the evacuation order has been lifted already. The government should think more about the local people."

(ii) Comment by a resident in Kawauchi (20km-30 km area)

"On March 11, immediately after hearing first news of the accident, many people in the village evacuated to this area. Young people were emailing 'evacuate' to each other, almost like chain mail. However, we did not receive any official information on the evacuation. We were only told to stay indoors through the emergency radio system. After hearing a neighbor who has a policeman in his family say, 'I'm going to evacuate because it seems dangerous,' I decided to evacuate. I heard that the police had left Kawauchi by March 14. The volunteers who were giving out food had used up the remaining gasoline for their transportation. I wanted them to help us evacuate as early as possible. I can only think that they abandoned us."





(iii) Comment by a resident of Iitate

"This area did not receive any information on the early stages of the nuclear accident. We heard about the radiation level only after the IAEA research team came in. Chief Cabinet Secretary Edano repeatedly said on TV that the radiation level 'will not have immediate health effects.' The reality is that residents in Iitate were exposed to radiation until April 22 (when the planned evacuation was ordered). It has been a year since then but we have received no damage compensation and the government is trying to cover it up by lifting the evacuation orders."

(iv) Comment by a resident of Hirono

"Because they might panic... Because people in areas with more danger would not be able to evacuate... How the evacuation area was expanded to 10km diameter in the next phase from 5km diameter in the initial phase... While we only had TV as a source

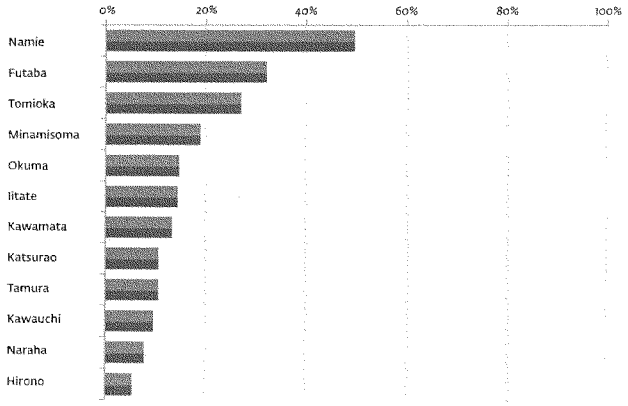
of information without accurate information or an idea of how the accident would develop, the minister in charge kept stating 'it will not affect health immediately...' TEPCO kept talking about the safety and reliability of the reactors... I am disgusted at the low quality of people in charge of this country."

(v) Comment by a resident of Kawamata

"They went on to say that there is no immediate effect, but the evacuation was explained on April 16. If they explained earlier, I could have found a specific place to evacuate. Although it was a large disaster, the response was too slow. The most important initial response based on the facts of the actual situation was not present and no orders based on 'measures in conformity' were given. I demand preparedness for emergency situations. All I saw was the politicians play party politics even though the nation is confronted with an unprecedented disaster. I question the humanity of those people. It is unfortunate that it was the nation who chose those people to be in charge."

Residents who evacuated to areas which later became evacuation zones

- Approximately 50 percent of the residents of Namie temporarily evacuated to areas with high concentrations of radiation..



Percentage of residents who evacuated to areas from which they later had to re-evacuate due to high concentrations of radiation ▶

Dissatisfaction about disclosing information from SPEEDI or monitoring data

- Many comments by the residents of Namie, Minamisoma, and Iitate showed dissatisfaction over disclosure of information from SPEEDI or monitoring data.

(i) Comment by a resident of Namie:

"The fact that I evacuated to an area with the highest radiation dose in the absence of SPEEDI information remains a source of fear for my health for the rest of my life. Why didn't they disclose the SPEEDI information? What do they think about people's lives? Our house is not in a livable condition due to difficulties in rebuilding infrastructure, decontamination and fear of having an interim storage facility nearby. Nuclear power should be stopped. It will cause a second Fukushima and there will be nowhere to live in Japan."

(ii) Comment by a resident of Minamisoma:

"I wish the information had been disclosed much earlier. I understand that the decision by the government not to disclose was intended to prevent a possible panic. But residents were evacuated to areas with high concentrations of radiation because of the lack of information. From now on, causes of the accident should be investigated and a

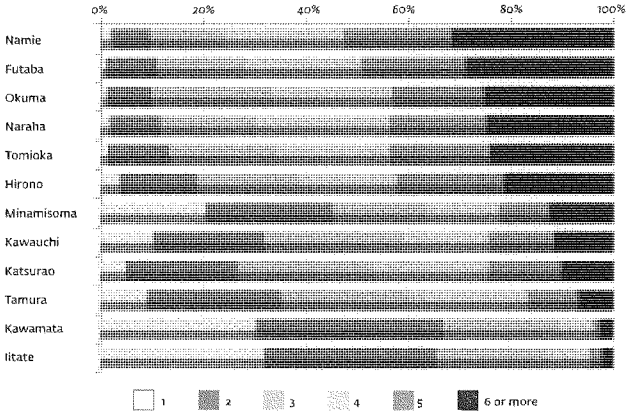
manual for response measures should be established, because we do not know when the next accident will occur. I request methods to minimize damages from the accident to be considered, given that it is hard to prevent it."

(iii) Comment by a resident of Iitate:

"I believe many people were exposed to radiation because of the inadequate accident response by the government and municipality. Data was deleted and deceptive instructions were given even though they were aware of the real situation. Do they really value our lives? Our family plowed snow outside of our house and got wet because we did not know about the radiation. We demand compensation for damages and health issues over the next few decades. What do members of NAIIC think of the lies that are being revealed even after more than a year has passed since the accident?"

Number of evacuations

- In the year after the accidents, the residents nearest the plant had to evacuate a number of times. Approximately 70 percent of the residents of Futaba, Okuma, Tomioka, Naraha and Namie had to evacuate four times or more.
- The government was slow in disclosing monitoring information.



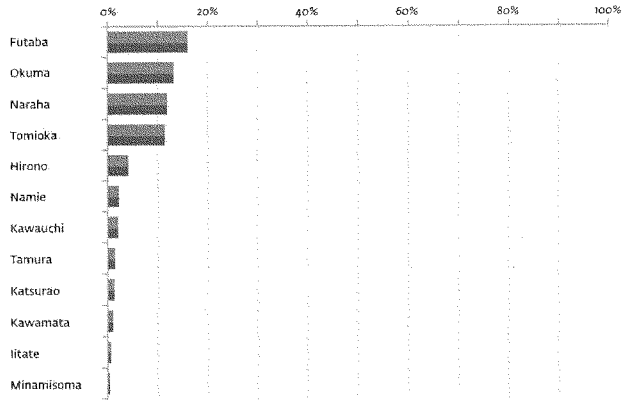
◀ *Number of evacuations prior to end of March 2012*

(i) Residents of Namie

"Even if we return to Namie the tiles on our roof have fallen off and radiation contaminated rain comes in. These are not conditions in which we can live. Every time I return, I feel angry. Our younger son also says that it is impossible for us to live here anymore. On the afternoon of March 11, when we were just about to patch the roof we were told to evacuate to the gym of the nearby Tsushima school. We stayed in the school for 3 or 4 days. It was a place with high radiation levels. We moved six places inside and outside of the prefecture and finally stopped after coming here." (Nihonmatsu)

(ii) Comment by a resident of Futaba

"On March 12, our hotel did not have electricity or water. We were allowed to stay in an old hotel and they shared gasoline with us. Our son is in Saitama Prefecture and he let us stay there for four months. Currently, we are living together as a family of four. When we visited our house briefly on March 6, my husband suffered from shock when he realized that he could not return to the house he was born in and is currently in hospital. We are frustrated with the irresponsibility and dishonesty of the politics of this country and TEPCO."



Percentage of residents who experienced evacuation training before the nuclear accident occurred ▶

(iii) Comment by a resident of Tomioka

"We had no clue what was going on but we were told to evacuate to Kawauchi. When we got there, we had to move from place to place and finally arrived at Miharu but we were told that it was full. We were told to go to the evacuation center in Motomiya. We later moved several times after that and are currently staying in a rental in Iwaki. Since then one year has passed but we have no idea of what we are going to do."

Residents who were told about the possibility of an accident or received evacuation training priar to the accident

- Even in locations near the plant, only 10-15 percent of residents reported receiving evacuation training, and less than 10 percent were told of the possibility of a nuclear accident.
- Some reported receiving an explanation that nuclear power plants were safe and secure, and so thought an accident would never occur.

(i) Comment by a resident of Futaba

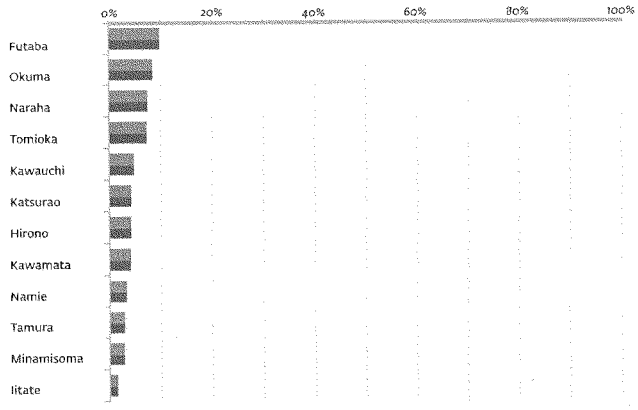
"I attended a lecture by TEPCO once. Raising the example of 9/11 in the U.S., they said that the nuclear power plants are safe no matter what happens. When I asked a question to reconfirm the absolute safety, the attendees at the lecture, many of who are family members of TEPCO employees, looked at me as if I did not understand any of what TEPCO told us. The attitudes and responses of TEPCO and the government, who seem to think so little of us, make me angry rather than sad. I demand a quicker and more sincere response."

(ii) Comment by a resident of Okuma

"I used to work at a nuclear power plant and never thought of such an accident. When I was working as a contract worker for TEPCO on the first floor, I asked a team leader 'what if a tsunami similar to the one in Sumatra hits Japan?' The reply was, 'Impossible! There is no need to think of an impossible situation.' After all, TEPCO, the government, and the municipality did not think seriously enough. Nor did I. . ."

(iii) Comment by a resident of Naraha

"When I attended a lecture for local residents by TEPCO soon after the company hid an accident from the public, TEPCO said they not only had the first 3 layers of protection, but also the 4th and 5th layers of measures for safety, with an attitude that the attending residents would not understand what it means to have so many layers for safety. Now I realize all of what TEPCO explained was lies, and that I was deceived."



◀ *Percentage of residents who had been informed of the possibility of a nuclear accident before 3.11*

(iv) Comment by a resident of Tamura

"They kept saying that the nuclear power plants are absolutely safe, then the accident occurred. If everyone involved thinks of the accident as merely an 'unforseeable accident' then this country must be very careless. The causes must be found and clarified. This accident must never be repeated. I want to give candid advice to the members of the Diet. They are supposed to consider the nation's daily life and rehabilitation, but they are preoccupied by political battles. While the accident investigation needs to be thorough, thorough discussion at the Diet must take place for the nation."

(v) Comment by a resident of Katsurao

"We used to watch TV advertisements every day claiming that nuclear power costs less and is safe and clean energy. With vivid memories of such a message, we could not believe the accident happened, nor could we imagine a tsunami bringing on the tragedy. We still live in cramped temporary housing after more than a year. We have no idea when we can go back to our home. We absolutely oppose the re-commissioning of reactors. No new reactors should be allowed, and we must shift to renewable energy. Laws and regulations for such plans need to be established quickly. The government should accelerate the progress of compensation for accident damage. It is not like compensation for a traffic accident.... I am tired of my current living conditions. I demand that the government step forward to take responsibility and make every effort to compensate the victims. I am counting on the government."

Messages extracted from the free comments ▶

Messages	No.	%
Causes of the accident should be probed ASAP, and outcome of the study fully disclosed. Demand for a thorough investigation in order to never let a similar accident happen again.	1,120	14%
Information issued by and behavior of government are unreliable and not trustworthy.	909	11%
Dissatisfaction or demand for compensation.	876	11%
• Dissatisfaction or demand regarding timing of compensation (urgent needs, etc.)	204	3%
• Dissatisfaction or demand regarding conditions for receiving compensation (discrepancies depending on region, age, employment status, etc.)	203	3%
• Dissatisfaction or demand regarding terms of compensation (demand to extend compensation period, grant lifetime compensation, compensation until return, etc.)	182	2%
• Dissatisfaction or demand regarding compensation amount.	93	1%
• Dissatisfaction or demand regarding compensation coverage (household goods, agricultural crops, costs for evacuation, loss of future profit, etc.)	46	1%
Demand for decontamination to take place quickly to allow return to our homes and neighborhoods.	858	11%
Need for clarification as to when things will become safe again and when people can return home safely. (Need for indication ASAP whether return will ever be allowed. Otherwise, there is no way to plan for the future.)	836	10%
Follow-up of actions taken at emergency is slow. No progress has been made even one year after the accident. Need direction soon.	820	10%
Information issued by and behavior of TEPCO are unreliable and not trustworthy.	628	8%
Demand that the state assumes liability. Strong resentment toward government.	610	8%
Demand that TEPCO assumes liability. Strong resentment toward TEPCO.	558	7%
The government does not understand the reality and situation of the evacuees. It must learn more about us.	544	7%
No home, no town to return to. Demand for a town elsewhere to be quickly designated as a place to be able to reside in. (No intention to abandon hometown, but there is no longer an option to return there.)	541	6% 7%
Residents were told that nuclear power plants are safe and secure. It was their belief that such an accident would never happen.	482	
I can't help but feel anxious about children and the future. I have no idea how one is supposed to live like this.	445	6%
Evacuation orders were slow; there was no evacuation order, or actual order was inconsistent with what was said by media.	375	5%
Evacuation orders were not specific. We had to run with little more than the clothes on our back and never had thought a nuclear accident was happening.	364	5%
Demand for early and ample compensation for land and house (provision of new house, repair or buyout of existing house).	344	4%
Constantly under stress due to unfamiliar environment, prolonged refugee life, feeling anxious about future, etc. Suffering poor health because of stress.	334	4%
Families are separated. We don't see each other much and miss each other.	290	4%
Wish for quick recovery of the lives we had. Wish for "restoring" ordinary life.	278	3%
Demand for a gradual reduction in number of nuclear plants. Wish for eventual elimination of all nuclear plants, and for a shift towards utilizing natural energy. Demand for elimination of nuclear power plants to ensure safe and secure lives.	276	3%
Evacuated to zones where radiation dosage was high. SPEEDI information should have been disclosed immediately.	201	2%
Decontamination will require immense budget and time. It must be performed based on well-planned decisions.	177	2%
Request for clarification of who is responsible.	172	2%
Feeling of fear that (adult) health might be negatively affected by radiation, and health may deteriorate once medication or outpatient treatment is stopped.	165	2%
TEPCO does not understand reality and situations of evacuees. It must learn more about us.	162	2%
Need for clarification on what we should do. Demand for a release from the current living situation and to settle down.	161	2%

Fear that health of children and unborn children might be affected by radiation exposure. (Also concerned about the decline in physical strength and the growth of children.)	*154*	*2%*
Relatives, friends and neighbors are separated. Losing contact with them and missing each other.	*137*	*2%*
Unemployed due to loss of workplace. No income and struggling to make a living. (Farming was former livelihood, but now impossible.)	*132*	*2%*
Running out of cash for living. Can't live properly. Urgently in need of compensation to meet living costs.	*121*	*1%*
Evacuation drills had been performed regularly, but were never based on a comparable accident (nuclear accident added onto natural disaster).	*119*	*1%*
Plant design might not have taken a tsunami into account. It had been said repeatedly that multiple layers of safety measures were applied, and that was reassuring.	*116*	*1%*
Very sad to see the familiar homeland contaminated by radiation. Feeling of being bogged down day-to-day, no joy, no hope.	*111*	*1%*
So disappointed not to be able to enjoy a comfortable retirement life after the accident. Frustrating to question why one has to lead such a life.	*97*	*1%*
Poor and uncomfortable facilities (obsolete, small, inconvenient, etc.) at the refugee housing (which are rented or temporarily provided). Want a new environment to be put in place quickly.	*92*	*1%*
Demand for community infrastructure (lifeline, transportation system, facilities and services) to be recovered immediately so people can live there.	*80*	*1%*
Demand for thorough compensation when disease develops as a result of radiation exposure. Also compensation should cover non-economic losses.	*69*	*1%*
Forced to relocate to several refugee sites, and repeatedly forced to evacuate.	*61*	*1%*
Moving to evacuation site took long time due to traffic congestion and road conditions.	*56*	*1%*
Preventative measures were not effectively executed because the events were beyond what was anticipated, and as a result emergency responses, decisions and actions lagged behind what was necessary.	*55*	*1%*
Lack of relief supplies and information was extremely limited after evacuation.	*55*	*1%*
Demand for academia, media and others to take responsibility.	*49*	*1%*
Private car was used to evacuate but scarcity of gasoline made evacuation difficult. Some could not evacuate effectively.	*44*	*1%*
Evacuation was difficult or not possible because of age, sickness, etc.	*41*	*1%*
Demand for prompt search for and provision of a place (land and house) to live safely and securely.	*41*	*0.5%*
Request to know for how long rented or temporary refugee housing is provided. Want to know whether there is another place available if we need to move out.	*36*	*0.4%*
There was no evacuation route. The only path was congested, which hindered smooth evacuation.	*27*	*0.3%*
There should have been effective emergency response measures, risk communication, routine preparedness, attitude, etc. Accurate information and evacuation measures could have prevented panic and confusion.	*24*	*0.3%*
It is difficult to get along with people in the new environment and can't build relationships. Feel isolated and alone at the refugee site.	*24*	*0.3%*
Wish for a "ray of hope" among evacuees. Wish to be engaged in making something for the future.	*24*	*0.3%*
Demand for increased frequency of brief visits home. Want to visit more often (eg. once a month)	*22*	*0.2%*
Lost a family member or a friend because of sickness stemming from fatigue following evacuation or because of the stress of evacuation life.	*18*	*0.2%*
Evacuated via bus because private cars were banned for evacuation purposes, but the reason behind this was never explained.	*17*	*0.2%*
It is sad and hard to be discriminated against, experience prejudice and misunderstanding just on the grounds of being an evacuee (or being someone from Fukushima). Feel ashamed at the refugee site.	*17*	*0.2%*
Demand for compensation to seek future employment or assistance to find a job. (Because of displacement, finding a job is difficult.)	*13*	*0.2%*
There was no instruction to wear a mask or protective gear.	*12*	*0.1%*
Hospitals experienced hardship in evacuating.	*10*	*0.1%*
Request for secure employment/re-employment at hometown once return there is permitted after prolonged evacuation.	*10*	*0.1%*

After we read all the survey responses, we extracted topics and tallied each topic as shown. As some responses contained multiple topics, an aggregate total of counts of all the topics exceeds the number of responses. Also there were responses not included in the data because they could not be categorized.

Survey of the workers at the Fukushima nuclear power plant

- After the accident, many of the TEPCO workers did not evacuate, but they stayed on-site in order to help with the accident response. Most of the subcontracted workers evacuated at 16:00 on March 11. There were problems with the communication of information to the subcontracted workers. On March 11, the subcontracted workers who did remain at the plant did not receive an explanation about the dangerous state of the reactors.
- Efforts to monitor the radiation exposure of those workers who fought to contain the accident at the plant were limited by the emergency conditions and the limited availability of measuring devices on-site. There were no reports on the cumulative radiation dose of individual workers, and no efforts were made to manage internal radiation. Many workers have expressed anxiety and frustration regarding the lack of worker radiation dose checks. This needs to be improved.
- Most of the workers who remained after the earthquake to deal with the accident were registered radiation workers.
- Some workers had to share one dosimeter with several others because the devices were limited. Very few were without a dosimeter at all.
- A system for managing dosimeters was unavailable. Because of this, about 30 percent of the workers were not told of their cumulative dosage, which is a problem.
- No significant difference in the response between TEPCO employees and its subcontracted workers over how measures against radiation were managed has been observed.
- Most of the workers who dealt with the accident were not told in advance that they would have to do so if one broke out. Some had to work without consent. There were problems with how employees were briefed on preparations against a nuclear disaster.
- Approximately 80 percent of the workers received an explanation about the radiation dosage in their operation areas, or were made aware of the radiation dosage of the site through dosage maps prior to working. Approximately 20 percent of the workers stated that they received no explanation about the radiation dosage in their operation area. Although it is necessary to have workers on-site to deal with the crisis, an explanation of the radiation levels and the risk should always be given.

Summary of the methodology of the workers survey

- This survey was conducted on the workers who were at Fukushima Daiichi Nuclear Power Plant on March 11, 2011.
- *Objective:* To understand the reality of the communication of information, evacuations, and health monitoring that went on inside the nuclear power plant.
- *Method:* Postal survey.
- *Duration:* April 27 to May 18, 2012
- *Targeted respondents:* Approximately 5,500 workers who were at Fukushima Daiichi Nuclear Power Plant on March 11, 2011, and are/were employees of TEPCO or subcontracted companies (*) which agreed to cooperate with our survey.
- *Total respondents:* 2,415 (Approximately 44% of the targeted respondents.)
- Of the 2,415 respondents, 1,060 respondents (44%) wrote in the free space for comments. Furthermore, 41 respondents wrote on the front and back of the survey sheet or provided further comments on envelopes and separate papers. We sensed their strong will to be heard.

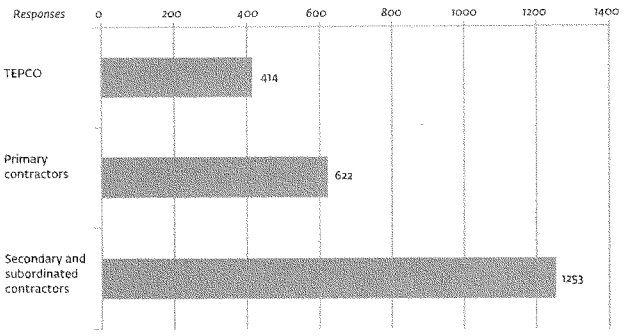
Distribution of respondent sample according to location

- Most respondents were working in radiation controlled areas on March 11.

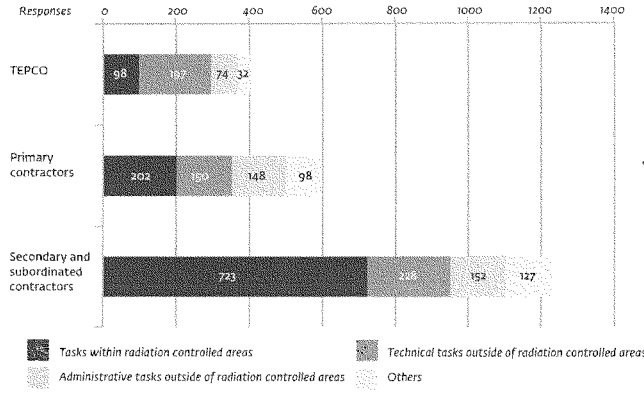
Communication of information to the workers during the accident

- Approximately 40 percent of TEPCO workers received a warning that the reactors were or could be in a dangerous state. On the other hand, hardly any workers from the subcontracted companies said that they received such a warning.

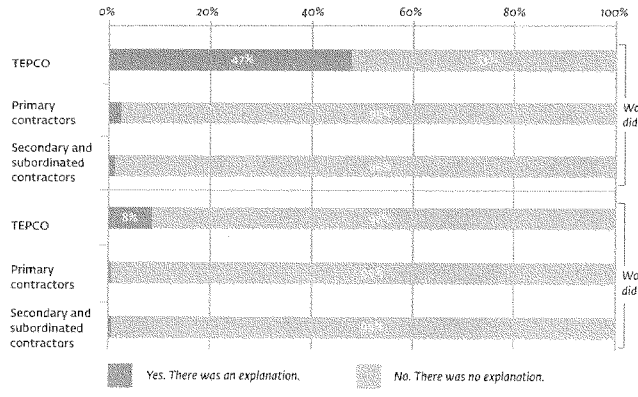
(*) Note: As we could not conduct the survey on the employees of companies that did not wish to cooperate with our survey, this sample does not accurately represent all the workers and is to a certain degree incomplete. Additionally, this Commission asked TEPCO subcontractors for the current addresses of the employees who worked at the Fukushima Daiichi Nuclear Power Plant on March 11, 2011, but some of them provided the addresses of employees who started working at the plant after March 11, 2011. These workers are included in the 5,500 targeted respondents. For this reason, it cannot be said that the samples taken through this survey give an accurate statistical analysis of the workers at Fukushima Daiichi on March 11, 2011. Therefore, please note that the responses may not be statistically reliable except for those from the employees of TEPCO, which provided the contact information of almost all its employees.



◂ *Total responses*



◂ *Survey responses by job type*



Workers who did not evacuate

◂ *After the earthquake on March 11, was there an explanation from TEPCO about hazardous conditions in the reactors or the possibility of such a situation?*

Workers who did evacuate

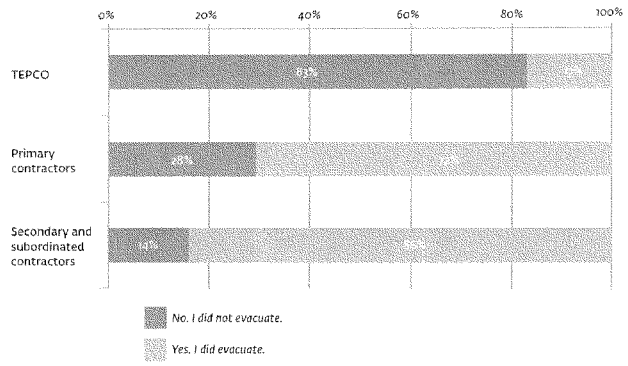
State of evacuation after the earthquake

- Over 80 percent of TEPCO workers did not evacuate after the earthquake and stayed on-site. Many of the subtracted workers evacuated from the plant facility at least temporarily.
- Almost all of the workers who evacuated on March 11 did so at around 16:00.
- Over half of the subcontracted workers who evacuated answered that they did not receive orders to evacuate. (This includes workers who answered that they went home because they received orders related to the earthquake, not because of the accident at the power plant.)
- Approximately 30 percent of primary subcontracted workers and 15 percent of the subordinated subcontracted workers remained on-site to deal with the accident.

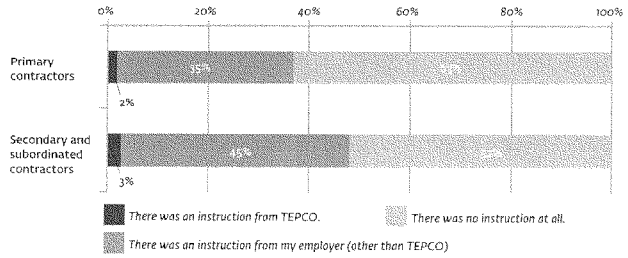
Workers involved in containing the accident

- Almost all of the workers who were involved in containing the accident were

On March 11, 2011, did you evacuate from within the the Fukushima Daiichi site (including temporary evacuation)? ▶



Did you receive instructions regarding the evacuation? (For workers who evacuated on March 11) ▶



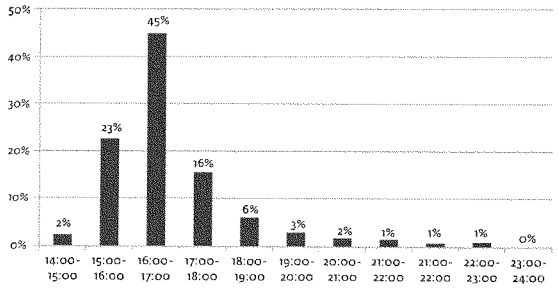
registered radiation workers.

- Only around 10 percent of the subcontracted workers who were involved in dealing with the accident received an explanation in advance about the possibility of the plant having a nuclear accident.
- Approximately 30 percent of TEPCO workers and 40 percent of subcontracted workers had not agreed to deal with such an accident.

Management of radiation

- As there was a lack of dosimeters due to the tsunami, TEPCO let multiple workers in areas with low radiation levels share dosimeters immediately after the accident. As a result, the percentage of workers who did not have any dosimeters was kept to 5 percent. No significant difference in the distribution of dosimeters among TEPCO workers and subcontracted workers was observed.

◂ *Ratio of occupational radiation workers to other workers engaged in accident response tasks*



◂ *If you evacuated from the Fukushima Daiichi site on March 11, 2011, at what time did you do so?*

- TEPCO manually tracked the workers' radiation dosage because the system of measuring and managing cumulative radiation became unavailable. However, around 30 percent of the workers said that they were never told of their cumulative radiation dosage. There is no major discrepancy between the TEPCO workers and subcontracted workers over the level of information given on dose exposure.
- As the accident evolved, radiation levels heightened outside the anti-earthquake building, even outside of the radiation controlled area. In response to this, TEPCO explained to workers engaged in tasks outside the anti-earthquake building about the radiation dose at the work sites and about the increased possibility of irradiation. While about 40 percent of the workers responded that they were briefed each time, 20 percent said that they were never given such information. No significant difference among TEPCO employees and subcontracted workers was observed regarding how and to what extent workers were informed of the exposure risks during their operations.
- Management of worker radiation exposure was conducted to the extent possible given the limitations and limited availability of the devices on-site. However, many workers stated that cumulative and internal radiation management and testing was insufficient.

Comment by a TEPCO employee

"There was no explanation at all about how dangerous it was until the early morning of March 15. I understand that it was a difficult situation and there was limited time to give explanations, but at least we wanted to he informed."

"We were supposed to manage our cumulative radiation exposure level on our own, perhaps because the database became unavailable due to the earthquake. But we didn't even have pen or paper. We had no way to accurately keep track."

"My cumulative radiation exposure level reached around 0.08 millisieverts as of the end of March, So I asked for a whole body counter check. The company refused, saying that I was not eligible for the test unless I reached 0.1 millisieverts. I was working in the main anti-earthquake building for two weeks from March 11, and I spent at least five to six hours a day there. I'm sure that I was internally exposed. In mid-May, I went through the WBC (white blood cell) check, but the results showed that I was less exposed than people who spent fewer hours in that building than I did."

Comment by a TEPCO employee

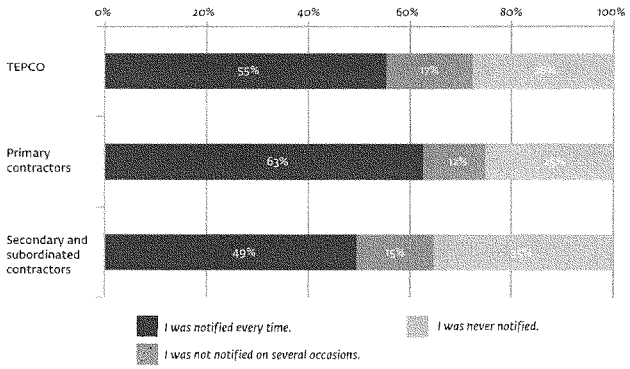
"I strongly call for a thorough follow-up, especially with the younger generation of workers, who are probably feeling abandoned. Some have been temporarily relieved of their jobs due to receiving their legal annual limit of radiation exposure. TEPCO executives are saying that this accident is not another Chernobyl, despite its scale, but I see no difference in terms of the suffering of the residents, especially the loss of their homelands. I don't want the executives to be so dismissive of this accident."

Comment by a TEPCO employee

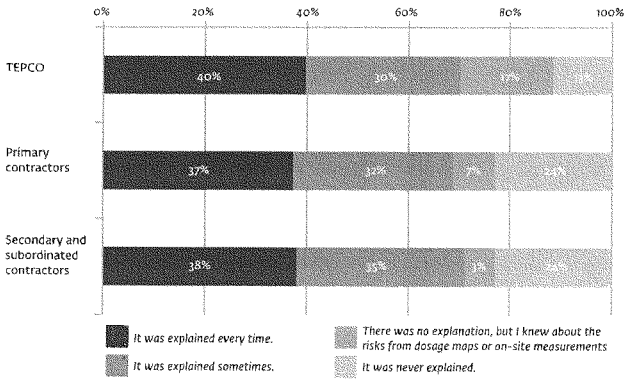
"Workers in the main anti-earthquake building were laboring under conditions where they couldn't trust anyone but themselves, and they were the only ones responsible for their own safety. Don't all of these problems stem from a fundamental lack of preparedness for disaster? I don't want to hear that this event occurred because it was 'unanticipated.' The government and the power company are accountable for the pre-existing problems that led to the disaster. Isn't it also NAIIC's responsibility to reveal these problems and report them?"

Comment by a subcontractor employee

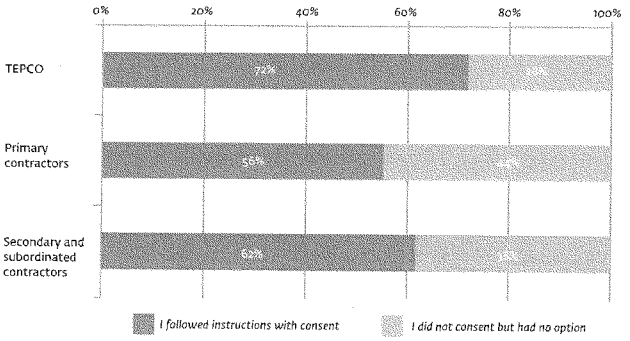
"No information whatsoever about the station blackout was delivered to the end-workers like us. I had to learn about the emergency evacuation orders for residents within 20km of the plant from TV. Though I was a subcontracted worker, I had to work on a 24 hour shift based on my existing contract. My employer knew there were several employees like me staying in the main anti-earthquake building. However, the company's managing director, deputy managing director and radiation protection supervisor all evacuated with their families. I finally managed to call our Tokyo head office on March 14, but they were not aware that there were still employees working in the main anti-earthquake building. I asked to evacuate, but they declined my request. I hardly ate or slept and I



◀ *Between the time of the accident and the end of March, did your employer notify you about your cumulative radiation exposure level every time you worked?*



◀ *Between the time of the accident and the end of March, did anyone explain about radiation levels or the possibility of exposure to radiation every time you worked outside of the main anti-earthquake building?*



◀ *Did you give your consent to be assigned to response tasks in the event of an accident?*

was reaching my mental and physical limits. I later told a general manager of TEPCO that I wanted to pull out, but it was very hard to get his consent. We found that the company car we were planning to use had been taken by TEPCO employees, but a colleague gave us a ride. I repeatedly requested a whole body check from my employer in late March and April, but my request was always denied. I was assigned to work at Daiichi at the end of April, which I refused to do because of health concerns. As a result I was later subjected to power harassment from my employer and I became mentally unbalanced. Because of this, I had to leave the company in June, which they termed a 'resignation for personal reasons.'"

Comment by a primary contractor employee

"For workers, there were almost no evacuation instructions. There has to be a clearly understood protocol for communicating information. Measures taken in response to the accident were uncoordinated and poor overall. This is also true from the perspective of the residents. Evacuation procedures and destinations were vague and still remain so. All these issues must be clarified. Only then can the recommissioning of the Oi nuclear power plant be discussed. There are workers who go back to their homes at night and try to lead daily lives after being exposed to radiation. This is inconceivable."

Comment by a primary contractor employee

"I was working at Fukushima Daiichi on March 11. When the earthquake happened I tried to go outside, but it took two hours to leave the premises of the plant because there were so many people. The first waves of the tsunami arrived while I was leaving, yet there were no announcements about tsunami. Thinking about it now gives me a chill in my spine."

Comment by a primary contractor employee

"The radiation level in the main anti-earthquake building was so high that under normal circumstances it would have been locked down to prevent entry. I had no choice but to try to estimate my radiation exposure level in my head. The main anti-earthquake building was clearly contaminated and there was a rise in the concentration of dust and iodine. Water was scarce, and I could not wash my hands to eat emergency food. I was clearly exposed to radiation internally. Water and electricity were urgently needed, however there was no supply of either from outside. The plant was completely isolated and I thought I had been abandoned."

Comment by a primary contractor employee

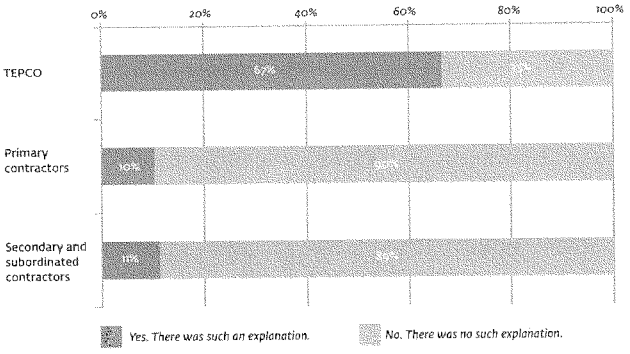
"Because workers were desperately needed, I didn't have time to confirm the well-being of my family, which bothered me so much that I could not concentrate on my duty. Responding to the accident was the priority, yet there was no way for the workers to track their exposure. I felt endangered. There were not enough dosimeters, so workers had to share them. Workers in charge of unnecessary tasks evacuated, but we did not. I feared for my life. The main anti-earthquake building survived the earthquake, but it did not protect against radiation. Hotspots in the building were marked with tape. Because the focus was on the accident response meeting between TEPCO headquarters and the plant, information was not transmitted to the surrounding area at all, though there was a radiation dispersion forecast from TEPCO's internal system based on wind direction. Workers who were engaged in accident response at that time deserve to be assigned to another location!

Comments by a primary contractor employee

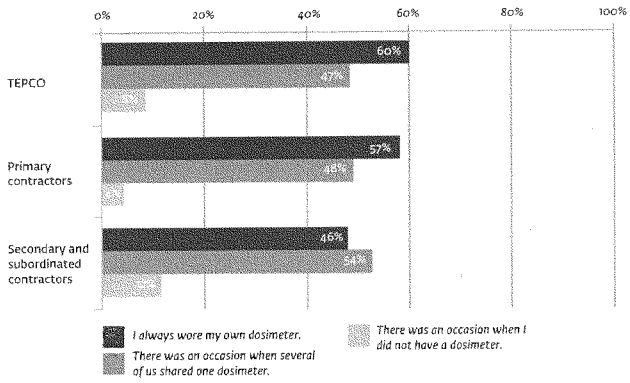
"The radiation dose management was sloppy right after the accident. Annual radiation dose management has been a vague issue for the past 15 years. The worker-to-worker deviation radiation exposure was large. I was over-exposed, about 0.15 milliSv/h external and 0.07 milliSv/h internal exposure, so now I can not work within the controlled area for the next five years.

Comments by a primary contractor employee

"After the accident, there were no whole body counter tests and it was deemed that there



◀ *Prior to March 11, did you receive any notification that you may be tasked with responding to an accident?*



◀ *Between the time of the Unit 1 explosion on March 12 and the end of March, were you wearing a dosimeter when you worked outside the main anti-earthquake* building?*

*(*The only building designated for coordinating the response to an earthquake and from which all crisis responses were staged.)*

was no radiation. (I wonder, could this be the result of orders from the electric companies and primary contractors?)"

"As there was no information disclosed during March 12-13, we did not know in what direction the radiation had dispersed when we evacuated."

"If decontamination is not prioritized, we cannot return to our homes. I hope that the decontamination will be conducted by volunteers from TEPCO and 100 percent TEPCO-related companies (i.e. by people who do not work at nuclear power plants)."

Comments by a primary contractor employee

"I don't think there was much attention paid to the workers who actually dealt with the accident. The first whole body counter was installed in Iwaki city, but only TEPCO employees were allowed to use it. Other workers had to go all the way to Kashiwazaki, and we almost never saw TEPCO people there. TEPCO left everything to the primary contractor. Before assigning blame, the operator should first focus on carrying out the initial response in the event of an accident."

Comments by a primary subcontractor employee

"As a primary subcontracted worker, I had no choice but to be involved in the work after the accident, which involved extremely high radiation levels by normal standards.

I have been worried about my health since March 11. After the accident, I received some compensation for the emergency from my own company, but it was a very small amount. Can we even say that our work was for the country? If it was, we should receive more money. I have suffered from stomach cancer before and if I get it again because of working on this accident and die, it will be unforgivable."

Comments by a primary subcontractor employee

I have worked in a subcontracted company for around four years—during which time I never once experienced evacuation training for a nuclear accident. TEPCO's mindset was that "there is no possibility that an accident will occur," and "we only need to do evacuation training for fires." Because of such irresponsible thinking, I was fired, I have lost my income, and I have had to evacuate far away in order to raise my three children and protect their health. I want our time and livelihoods back."

Comments by a primary subcontractor employee

"I demand to receive sufficient compensation and insurance as soon as possible. We cannot wait for another day to receive our compensation."

"I think that this accident was going to happen eventually. TEPCO is expert at hiding information. Even now, TEPCO has not disclosed all of the information regarding water leakage etc."

"The government and TEPCO should have referred to past accidents such as the one in Chernobyl when formulating their response to this accident. There have not been any apologies to the evacuees. How can this be acceptable?"

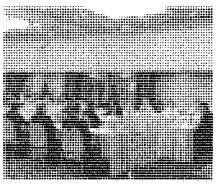
Comment by a subordinate contractor employee

"On the news it was reported that the plant workers who were dealing with the accident were prepared to die, but I was watching the news, thinking that there is no way we were ready to die. I did a whole body check for the first time at the end of April, and my radiation dosage was unbelievably high. My heart goes out to the people who are still working to deal with the accident. I hope that the people working at Fukushima Daiichi will take care of their health."

Commission meeting reports

1st Commission Meeting

Location:
The Fukushima View Hotel, Fukushima Pref.
Date:
December 19, 2011



1st Commission Meeting

The Fukushima Nuclear Accident Independent Investigation Commission held its first commission meeting at the Fukushima View Hotel in Fukushima city on December 19, 2011. The Commission approved the draft of the regulations governing its operations, appointed a project manager, decided on the structure of working groups and its office and officially started its activities. There was also a report from commission member Reiko Hachisuka, on the tough conditions the affected people are in today. Ms. Hachisuka, who moved from her home in Okuma, where the Fukushima Daiichi nuclear power plant is located, to live in the temporary residences provided in Aizu Wakamatsu, stated that evacuees now live without any sense of emotional security or stability, despite having been continually assured of the plant's safety for many years by TEPCO and the government.

In order to gain a first-hand grasp of the conditions at the plant and surrounding area, the Commission visited the plant itself on December 18. It also observed the decontamination operations run by Okuma Municipal Office. Upon the closure of the first Commission meeting on Monday, we visited the temporary housing in Kawamata which accomodates evacuees from Yamakiya district of the same town, where radiation levels are high. We heard directly from the town's mayor, Michio Furukawa, and the chair of the temporary residence community association, and saw the operations underway to decontaminate the farmland and forests of Yamakiya district.

2nd Commission Meeting

Location:
Keisei Memorial Hall, Tokyo
Date:
January 16, 2012

Witnesses:
Yotaro Hatamura, Chairman, Cabinet Office Investigation Committee on the Accident at the Fukushima Nuclear Power Stations of TEPCO
Shinji Ogawa, Director General, Cabinet Office Investigation Committee on the Accident at the Fukushima Nuclear Power Stations of TEPCO
Masao Yamazaki, Executive Vice President, TEPCO
Masayuki Ishida, Chief Manager, Nuclear Power Quality Inspection Division, TEPCO
Masayuki Ono, Chief Manager, Nuclear Power Quality and Safety Division, TEPCO
Itaru Watanabe, Senior Deputy Director-General, Science and Technology Policy Division, MEXT
Yoshinari Akeno, Division Manager, Nuclear Safety Division, Science and Technology Policy Division, MEXT
Tadao Kanda, Chief Manager, Evaluation of Policy Division, Minister's Secretariat, MEXT

The Commission appointed its acting chairman and co-chairman of the working group. We received an explanation of the interim and initial reports on the Fukushima nuclear power plant accident from the government accident investigation-verification committee, TEPCO and the Ministry of Education, Culture, Sports, Science & Technology (MEXT), respectively.

3rd Commission Meeting

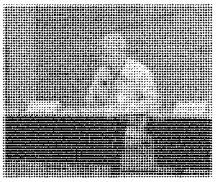
Location:
Shimin Plaza Kazo, Saitama Pref.
Date:
January 30, 2012

Witness: Katsutaka Idogawa, Mayor of Futaba.

Mayor Katsutaka Idogawa of Futaba explained the status before the plant accident and the conditions at the time of the accident and evacuation. He also exchanged opinions with the Commission. After the Commission meeting, we held a town meeting in order to hear fresh comments from the town residents on the accident and evacuation, as well as on details of life as evacuees.

Idogawa's comments:

- "Ever since I was appointed as the mayor, I kept expressing our concern about the nuclear power plant to TEPCO and NISA. They kept telling us there is no need to worry, that the plant is absolutely safe. But the accident actually happened. They cannot say the reasons for the accident are 'factors beyond their assumptions.'"
- The off-site center was useless because it was too close to the power plant. It needs to be verified what kind of accident the emergency off-site center was designed to deal with.
- It is necessary to clarify the role played by the nuclear regulatory bodies and their relationship with the industry. In regard to TEPCO, we would like investigation into all factors that could have contributed to the accident. We need to know whether frontline concerns were ignored to put business efficiency first, whether appropriate personnel training was conducted and technical skills were properly passed on, and what kind of training was given to the large number of temp staff that got hired for regular inspections. We need to know whether the crisis management division was functioning appropriately.
- In regard to Fukushima Prefecture, investigation is necessary in such areas as whether it disseminated appropriate information to its people and whether the prefecture is now providing protection to the people according to their needs.
- With regard to the level of radiation exposure, there are different explanations and standards, which is very confusing. The maximum cumulative amount of exposure for the general public by law is 1 millisievert per year. The accident has caused us to be exposed to radiation other than natural background radiation. It is outrageous that TEPCO claims the radiation released from its power plant is *bona vacantia*, an ownerless object for which they cannot be held accountable.
- After we evacuated, there were no communications whatsoever from the government. Television was the only source of information.



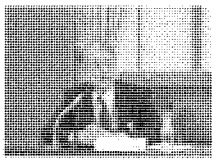
Katsutaka Idogawa

4th Commission Meeting

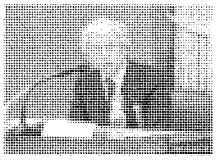
Location:
The National Diet of Japan
Date:
February 15, 2012

Witnesses:
Haruki Madarame, Chairman, Nuclear Safety Commission (NSC),
Nobuaki Terasaka, Director-General, Nuclear and Industry Safety Agency (NISA)

1. *Outdated guidelines*: Haruki Madarame, Chairman, Nuclear Safety Commission, admitted that the safety guidelines were defective and expressed his apology. Also, the accident in Fukushima emitted far more radiation than the scenarios done in a "hypothetical accident" set in the guidelines, where the scenarios had assumed a significantly smaller scale than the severe accident scenarios used by many other countries. The Guideline for the Reactor Site Evaluation, which was established in 1964, is still in place regarding construction permits for nuclear power plants. It was called outdated during the hearing, and Madarame's opinion was that the guideline needed to be amended.
2. *Lack of preparation by agencies*: Both the NSC and NISA had mandates to maintain the safety of nuclear power, yet lacked preparation for emergency situations. Moreover, both the NSC and NISA were found to lack an understanding of their fundamental tasks of protecting the surrounding residents and the nation.
3. *Insufficient knowledge*: The hearing revealed a lack of technical knowledge and nuclear engineering skills by the regulating agencies and the leaders of those agencies. The hearing also reminded everyone about the profound importance of independence and how important decisions and suggestions based on scientific facts and analyses are for those agencies to function properly. Obviously, Japan has a clear responsibility to establish safety standards and guidelines that are trustworthy at a global level.



Haruki Madarame

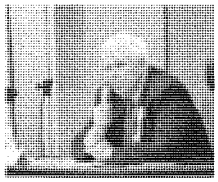


Nobuaki Terasaka

Location:
The National Diet of Japan
Date:
February 27, 2012

5th Commission Meeting

Witness: Richard A Meserve, former Chairman of the U.S. Nuclear Regulatory Commission (NRC), President, Carnegie Institution for Science



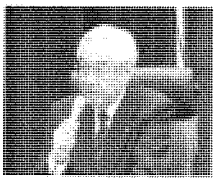
Dr. Richard A Meserve

1. *Proactive mindset:* Those responsible must make a continuous effort to raise existing safety standards. The construction and operation companies should not presume the quality of the standards of the regulatory agencies, and should not have a passive mind-set toward security and safety issues.
2. *Operator responsibilities and independency:* The nuclear plant operators have the most clearly defined responsibility to prevent accidents and stop any escalation in consequential damages. In an emergency situation, the operator is required to make decisions, and should avoid asking the government. For this reason, the operators must be competent to do so.
3. *Regulatory agencies responsibilities and independence:* The role of the regulatory agencies is to require sound decisions by the operator and to implement the decisions to prevent any escalation of damages. The agencies must maintain independence from the operators and the government. The agencies should also clarify the roles of the operator and the government, and the chain of command. These should be rehearsed repeatedly.
4. *Transparent decision-making:* It is important to maintain transparency in all the decision-making processes, except for those related to national security. It is important for participants to openly provide opinions to gain trust.
5. *The importance of human resources:* Japan should learn from the NRC model, where the majority of employees spend their entire careers on nuclear safety, and provide proper incentives to experts. In Japan, professionals trained in rotational positions within the bureaucratic entities often proved dysfunctional in emergency situations.
6. *Independent and transparent investigations:* The most important essential traits in the investigation of the nuclear accident are independence and transparency.

Location:
National Diet of Japan
Date:
March 14, 2012

6th Commission Meeting

Witness: Sakae Muto, Advisor of Tokyo Electric Power Company (TEPCO) and Former Executive Vice President and General Manager of Nuclear Power & Plant Siting Division of TEPCO



Sakae Muto

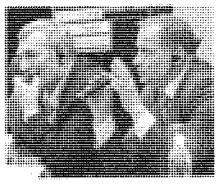
1. *Government-operator relations:* We heard unexpected testimony that the cabinet participated in discussions of technical matters regarding the nuclear reactors. Prime Minister Kan asked for the mobile phone number of the head of the plant at Fukushima, leaving the top management of TEPCO out of the loop.
2. *TEPCO competency:* Muto stated that the operator was primarily responsible for the accident, but questions remain about TEPCO's competence in taking on this responsibility.
3. *Lack of accident preparation:* There were ongoing discussions on the safety culture and preventive actions taken against earthquakes. Muto implied that the cause of the accident was due to the unexpected tsunami, but the possibility of a tsunami was estimated in 2002—so TEPCO must have recognized the risks. Muto, however, claimed to have been unaware of such studies. This obviously was a failure of the safety culture within TEPCO.

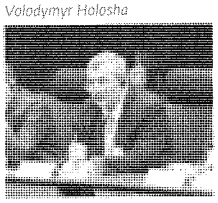
Location:
The National Diet of Japan
Date:
March 19, 2012

7th Commission Meeting

Witnesses:
Volodymyr Holosha, Head of the State Agency of Ukraine far Exclusion Zone Management,

Ministry of Emergency Situations
Anatoliy Gora, Deputy Head of the Chernobyl Nuclear Power Plant
Leonid Tabachnyi, Vice-Chairman, Geophysical Observation Center of Hydrometeorology Department, Ministry of Emergency Situations of Ukraine


Volodymyr Holosha

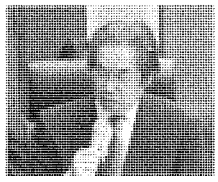

Leonid Tabachnyi

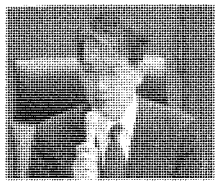
1. The Chernobyl accident was different from Fukushima in the various types of radioactive materials released, the weather pattern, the geography and the condition of the reactor containment vessels. However, both received the same level 7 (severe accident) designation on the International Nuclear Event Scale (INES). Chernobyl resulted in a significant emission of radioactive material and affected the environment and the lives of many people. It was valuable to hear about the real experience directly from the people who fought against the spread of damages from the accident. The emitted radioactive material continues to significantly affect public health and the environment even 26 years after the accident.
2. Regarding exposures issues: Many people who worked in the contaminated areas were exposed to radiation in Ukraine. Many infants who were exposed to radiation contracted thyroid cancer. Radiation exposure not only causes thyroid cancer in infants, but affects the whole body. Evacuated people suffered from stress and radiation phobia. Contaminated food items are monitored and controlled separately by type, amount of consumption and so forth.
3. Regarding information disclosure issues: The necessity of disclosing information has been acknowledged by the Ukraine government after the lessons learned from the time of the USSR. Nonetheless, there are many technical measures, such as becquerels, sieverts, and curies, that are unfamiliar to many people. Information to the public can be disclosed in alternative ways regarding levels of contamination.

8th Commission Meeting

Location:
The National Diet of Japan
Date:
March 28, 2012

Witnesses:
Ichiro Takekuro, TEPCO fellow and head of TEPCO's nuclear power business prior to the accident. He was at the Kantei during the accident
Kenkichi Hirose, Special Adviser to the Cabinet Office, in charge of the NSC, former Secretary General of the Nuclear Safety Commission (NSC) and former Director General of the Nuclear and Industry Safety Agency (NISA)


Ichiro Takekuro


Kenkichi Hirose

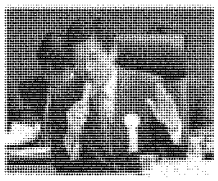
1. *TEPCO competence:* Despite the fact that TEPCO has the primary obligation to prevent accidents and minimize damages, the company was found to be lacking the self-governance competance to set adequate measures for the prevention of accidents, and the culture to make concerted efforts to improve nuclear safety from the people's point of view. Moreover, TEPCO does not clearly recognize the nuclear safety tasks and obligations that are necessary for an operator of nuclear power. Regarding the defense-in-depth program, Takekuro stated that TEPCO had been focusing on the first three levels of defense-in-depth, implying that TEPCO was not responsible for implementing the fourth and the fifth levels. At the time of accident, TEPCO sent Takekuro to the Prime Minister's office to report in detail on the accident conditions to the Prime Minister. However, it was found that Takekuro was actually sending commands to the accident site on behalf of the Prime Minister. It is obvious that TEPCO's corporate culture has been lacking in efforts to prevent accidents and to improve nuclear safety as a part of their obligation as a nuclear power plant operator. This point is also evident given TEPCO's long history of concealing accidents.
2. *Regulatory agency responsibilities:* The hearing clarified that the nuclear power regulatory agencies such as NISA have not been meeting their first obligation: public safety. Their liability in ignoring the basics of creating a safety culture, such as leaving essential safety measures like backchecks to the operators, and disregarding the recommendations of IAEA, is overwhelming. It is also clear that the double-check feature

between NISA and NSC has not been functioning. The dysfunctional attitudes and irresponsible behavior found in the hearing are not only attributable to Hirose and other leaders. The government also is quite heavily liable, as it was responsible for creating NISA as an administrative organization under METI.

Location:
The National Diet of Japan
Date:
April 18, 2012

9th Commission Meeting

Witness: Hiroyuki Fukano, Director General, Nuclear and Industry Safety Agency (NISA).



Hiroyuki Fukano

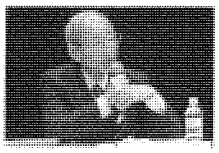
1. *Safety Guideline:* The Safety Guideline was revised by the government after the Fukushima accident based on the measures stated in the "Technological Findings" which is a provisional analysis. The accident conditions assumed explicitly in the revised Safety Guideline are narrowly defined as an accident with an event sequence identical to that of the Fukushima accident. There is no measure or definition set for a potential accident beyond the assumed accident scenario in the revised Safety Guideline, and there are few necessary safety measures as stated below.
   - The plan to build earthquake-resistant buildings, which turned out to play a critical emergency role in the Fukushima accident, is defined as a "medium-term task."
   - The plan to implement filtered ventilation, which has been implemented in many European countries, is defined as a "medium-term task."
   - The emergency evacuation plan, which is most important to the safety of residents, is set outside of the scope of discussion in the "Technical Findings" that have been used as the rationale in the revised Safety Guideline.

Location:
Nihonmatsu, Shimia Kaikan, Fukushima Pref.
Date:
April 21, 2012

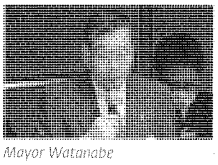
Location:
University of Aizu, Fukushima Pref.
Date:
April 22, 2012

10th Commission Meeting + Namie town hall
11th Commission Meeting + Okuma town hall

Witnesses:
Mayor Baba of Namiemachi and six other witnesses at the 10th Commission Meeting in Nihonmatsu
Mayor Watanabe and four other witnesses at the 11th Commission Meeting in Aizu Wakamatsu. After each Commission meeting, Commission Members heard from the residents during town hall meetings.



Mayor Baba

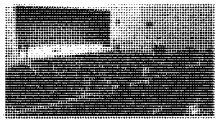


Mayor Watanabe

1. *The anger of the evacuees*: We felt the raw anger of the residents as shown by the following comments: "We had to evacuate without any information from the government, the prefecture, or TEPCO about the accident itself, instructions on the evacuation, or in which direction we should evacuate." "There should have been someone, such as a TEPCO employee, providing information at earlier stage." We recognized once again the importance of easy-to-understand and timely information communication processes.
2. *Assuring the safety of residents*: A local government official commented that he is asking himself "whether the local government fulfilled its role to assure the safety of the residents." Others said "Emergency evacuation drills turned out to be training for the sake of doing training. It was for the self-satisfaction of the organizer—shouldn't the training have been done under more realistic assumptions?" The findings from our previous commission meetings suggest that the regulators completely lacked the mindset to safeguard the residents.
3. *Message from the towns hosting nuclear power plants*: We heard important opinions, especially from the people of Okuma. Notable comments included: "The people from the towns hosting nuclear power plants were so used to hearing 'how safe the plants are.' We had been brainwashed." "I had never thought that a nuclear power plant could become a problem." "There was no communication about potential issues which are

out of human control." These comments can be very important to people in all towns that host nuclear power plants.

4. *Relationship with and confidence in the government*: We heard feedback regarding the government, specifically that it failed to provide the necessary information at the time of the accident: "I still cannot trust the government," "I am not confident about the information provided by the government on the current condition of Unit 4 and the radiation dose level."
5. *Evacuee life and the future*: We realized fully that the belated or indefinite evacuation instructions, as represented by the use of the phrase "just to be sure," affected the residents severely. A participant called for the need "to install a system in which the government continues to monitor the health conditions of the people from generation to generation." Moreover, many residents repeatedly expressed their shared earnest desire "to not let other municipalities hosting other nuclear power plants experience what we experienced."



Namie town hall meeting

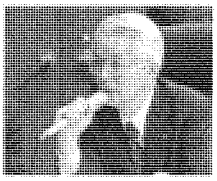
Okuma town hall meeting

12th Commission Meeting

Location:
The National Diet of Japan
Date:
May 14, 2012

Witness: Tsunehisa Katsumata, Chairman of Tokyo Electric Power Company (TEPCO) and former Chairman of the Foundation of Electric Power Companies of Japan (FEPC). Katsumata was president of TEPCO from October 2002 and has been chairman since February 2008

1. *Accountability of a nuclear facility operator and the Prime Minister*: While he mentioned that "electric companies are unambiguously responsible for the safety of nuclear power plants," he stated that "it was the Prime Minister who was the director-general of the emergency response headquarters, where judgment at the plant site needed to be prioritized." Also the top three management members (president, chairman, and vice president) were unavailable when the accident broke out. Katsumata only found out that the President had been away after the accident happened. A lack of a sense of impeding crisis was obvious from the fact that he made no contact with the president after the president's return from abroad until his return to the head office.
2. *Critical facts about tsunami*: The causes of the accident, according to his statement, are "under investigation at TEPCO." However his assertion that the unanticipated tsunami was the primary cause was disorienting. It revealed that the risk posed by unanticipated potential tsunami had not been communicated internally to the president. It turned out that Katsumata had determined that "such tsunami would not happen in reality." It seems that the risk of tsunami had not been considered probabilistically.
3. *Regulatory environment*: He emphasized the simplification of regulations, but the measures which operators carry out independently, including earthquake-resistant backcheck and severe accident responses, had not been taken by TEPCO and other operators. Serious doubt remains about the implication between the call for simplified regulations and the delayed actions by TEPCO. The Commission also learned the little-known fact that the FEPC had been the forum for lobbying.
4. *General overview*: Katsumata admitted that he can look back and think of a number of measures that should have been implemented—such as anti-tsunami measures and severe accident responses, but he declined to specify further. The public should determine through today's discussion if he was sufficiently competent to be the top manager of a giant power company that utilizes nuclear power.

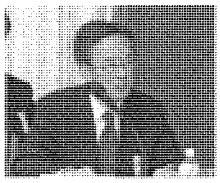


Tsunehisa Katsumata

13th Commission Meeting

Location:
The National Diet of Japan
Date:
May 16, 2012

Witness: Kazuo Matsunaga, Vice-Minister of Economy, Trade and Industry (METI) at the time of the accident and Director General of the Nuclear and Industry Safety Agency (NISA) from June 2004 to September 2005.


Kazuo Matsunaga

1. *Decisions made as Director General of Nuclear and Industry Safety Agency (NISA):* The witness stated that he could not spare time for the implementation of the new anti-quake guideline because he was too busy dealing with responses to the accident at the Mihama nuclear plant. He avoided explaining his own involvement in the stress tests and stated that any discussion on introducing B.5.b was not his business. As such, he was not directly a part of the important aspects of nuclear safety, and he avoided clearly defining his own accomplishment and responsibilities.
2. *Judgments regarding nuclear safety in re-operation of nuclear power plants:* The question still remains whether informed, appropriate decisions about energy policy and nuclear safety are being made by the top authorities. If METI is making judgments about the safety and re-operation of nuclear plants prior to the completion of the accident investigations by the government, they may not be in full possession of the facts. This point was also made by the METI minister, Banri Kaieda, on June 18, 2011.
3. *Responsibility for maintaining sufficient supply of electricity:* Matsunaga was asked if he knew whether TEPCO was releasing all the correct information about its power supply capabilities to the public. But he claimed to be unaware of any failure on TEPCO's part.
4. *About introduction of plutonium thermal use:* We found that the government may have rushed the regional government to make a decision on the implementation of plutonium thermal use in Unit 3 of Fukushima Daiichi by presenting the benefits of government subsidy, while there was not enough time to thoroughly perform a possible anti-quake backcheck.
5. *Competency in emergency response engagement:* METI was probably inadequately prepared, as was NISA. In light of the findings from this hearing, we need to profoundly consider whether the current organizational structure surrounding nuclear regulatory agencies, including METI, which plays the roles of both promotion of nuclear power and maintaining nuclear safety, can be improved to function more properly.

14th Commission Meeting

Location:
The National Diet of Japan
Date:
May 17, 2012

Witness: Banri Kaieda, a member of the House of Representatives and Minister of Economy, Trade and Industry (METI) at the time of the accident.

1. *Witness' understanding of facts at the time of accident:*
   a) Kaieda stated that he feels responsible for the delay in declaring a Nuclear Emergency Situation and that it was because convincing the Prime Minister to do so took time.
   b) He did not know the reasons for then Prime Minister Kan's visit to Fukushima Daiichi nor its purpose.
   c) Kaieda received a phone call about evacuation directly from Shimizu, TEPCO president at the time of the accident. The witness recalls, "Daiichi Power Plant," "Daini Power Plant," and "evacuation," but not "full withdrawal." Furthermore, Kaieda understood the direct phone call from Shimizu to have significant meaning.
   d) Kaieda stated that he felt TEPCO was hesitant to make a decision to ventilate, as well as to decommission Units 5 and 6. Also stated was the reason for issuing an order to ventilate in accordance with the Nuclear Reactor Regulation Law—to prod TEPCO into doing the venting. This revealed ambiguity in the definition of the responsibilities of the government and operators.
   e) Kaieda mentioned that from immediately after the breakout of the accident, communicating and sharing information among the accident site, the Kantei, and TEPCO

headquarters was like the telephone game "whispering down the lane". He went on to state that "the government has to think this issue over."

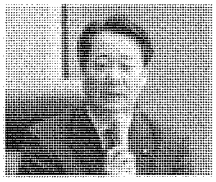
f) The preparedness by the government was "not enough," the witness said. In addition, he stated that "the trainings should have included use of SPEEDI."

g) The witness made a critical statement about the hydrogen explosions—"nobody had ever thought of a possible hydrogen explosion at that time." Also he expressed his regrets that he was unable to prevent the hydrogen explosion. He felt the lessons from Three Mile Island were not utilized.

2. *Regarding the Stress Tests*: In consideration of use of the stress tests as a requirement to restart nuclear plants, Kaieda stated that he did not even consider mandating back-checks as a possible alternative to speed up the process of the operators.
3. *Ideal regulatory organization and emergency response organization*:

a) Kaieda said that the emergency response organization should be lean with all members understanding their own roles clearly. He thought NISA did not meet the expectations of the people in performing its role.

b) He encouraged the regulatory agencies to be independent and to be safety-oriented. The regulatory organization should include experts on radioactive materials with the proper knowledge and equipments to respond in emergency situations.



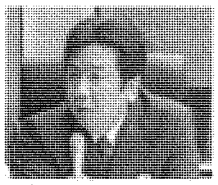
Banri Kaieda

15th Commission Meeting

Location:
The National Diet of Japan
Date:
May 27, 2012

Witnesses: Yukio Edano, Minister of Economy, Trade and Industry. He was the Chief Cabinet Secretary at the time of the accident.

1. *Edano and Shimizu on full-withdrawal:* Edano does not recall the exact words used with respect to the plans for withdrawal. However, he remembers that he conveyed his view that if a full withdrawal of staff from the plant were to take place, deterioration of the state of the plant could not be stopped. In response to Edano, Shimizu (President, TEPCO) could not find the words to respond, and said nothing. Based on this reaction, Edano further stated that "it was clear that the intent of the proposal (by Shimizu) was not for a partial withdrawal." During a phone call, Yoshida, the General Manager of Fukushima Daiichi, replied to Edano's question about withdrawal, saying, that "there are still actions to be taken here. We'll do our best."
2. *Notification of public disclosure of information*: Edano directed TEPCO to notify the Prime Minister's office of any information disclosed to the public at the time of the disclosure, but the direction was not intended to require TEPCO to obtain approval from the Prime Minister's office prior to the disclosure.
3. *Accepting international support:* The Prime Minister's office had been directing ministries to accept any international support offered, even if they might be required to overcome legal issues to do so.



Yukio Edano

Edano then added the following statements in light of his experience:

1. *Insufficient information distribution*: Based on the discussions today he recognized that information had not been communicated sufficiently from the viewpoint of the public and residents of the area. At the time he thought it sufficient. He recognized that communication concerning personal risk needed to be improved.
2. *Problems in information handling*: He pointed out problems in gathering, predicting and anticipating information. As an example, he stated that the term "precautions" used in public releases was not founded on clear grounds.
3. *Need to separate roles of Chief Cabinet Secretary and Spokesperson*: Edano noted that in the absence of a stand-alone government spokesperson, the Chief Cabinet Secretary acts as a secondary or dual role. He thinks that particularly in times of an emergency, these two important roles should be separated. A spokesperson should be specially trained.

Location:
The National Diet of Japan
Date:
May 28, 2012

Former prime minister Naoto Kan

16th Commission Meeting

Witness: Naoto Kan, a member of the House of Representatives; Prime Minister of Japan at the time of the accident

Pre-accident conditions

1. The accident occurred at a nuclear power plant which had been built and operated as part of national nuclear policy, and thus the government bears the greatest share of the responsibility for the accident. Kan, who was the leader of the government at the time of the accident, apologized once again for being unable to stop the accident from evolving.
2. With regard to the nuclear accident response, neither the authority of the Prime Minister nor that of the director general of the emergency response headquarters had ever been explained to Kan in detail prior to the accident.
3. The authority of the director general of the emergency response headquarters had not necessarily been fully recognized by Kan when the comprehensive emergency response drill was conducted.

During the accident

1. Visiting the plant managers on site was considered helpful for Kan to understand the situation, as he could not obtain any meaningful information from the members of NISA, the NSC, or the technical advisor from TEPCO regarding what needed to be done at Fukushima Daiichi.
2. There was no awareness that the plant would reach its re-criticality as a result of injecting seawater instead of freshwater, although Madarame (Chairperson, NSC) had indicated that such a possibility was not zero. Kan also stated that although it has been reported that decisions (to suspend seawater injection) came from the Kantei, it could have been a statement made by the TEPCO personnel who were then at the Kantei.
3. There were two calls from Yoshida (the General Manager, Fukushima Daiichi) to Hosono (Special Advisor to Prime Minister, Cabinet Office) on matters relating to the full withdrawal. In the first call Yoshida said that the situation was "extremely intense," and in the second call that "water injection has begun, and that it looked okay." Kan recalls that he called back once but does not remember the details of that conversation. Then, early on March 15, the minister of METI woke Kan and it was then that Kan first heard about TEPCO's proposal to withdraw, which he thought was absurd.

Responses by the government and the Kantei (Prime Minister's Office):

1. With the largest ever double disasters—earthquake and tsunami—and a nuclear accident at the same time, it was difficult for the off-site crisis control center located in the Kantei to function sufficiently as a control room.
2. The Act on Special Measures Concerning Nuclear Emergency Preparedness (Nuclear Emergency Response Act) was ineffective, and the Kantei had to act as commander in chief.
3. Calling the accident site was an extraordinary action, which Kan believes could have been possibly avoided if information had been appropriately provided to him by TEPCO and/or NISA in a timely manner.
4. It was Edano (Chief Cabinet Secretary at the time of the accident) who declined the offer to station non-Japanese experts at the Prime Minister's office. Kan was not informed about this decision.
5. Kan was not aware that overseas assistance was declined by NISA. It is a big problem if it is true.
6. Kan took diverse advice, even from beyond official channels.
7. Kan requested support from several specific Diet members, but the request was not intended to make them act as an advisory team.

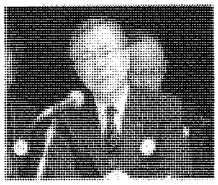
Future tasks: Kan recognizes that the March 11 disaster has brought attention to some fundamental problems of Japan. He believes that the first step to reforming the nuclear pol-

icy is to dissolve the organizational structure of the nuclear community in Japan, controlled mainly by TEPCO and the Federation of Electric Power Companies of Japan (FEPC). Furthermore, inviting experts from abroad may become a catalyst to restructuring the nuclear community in Japan. He expressed his position that Japan should aim at becoming free of nuclear power plants. Kan expressed his respect and appreciation to the people who worked hard on-site to address the nuclear power plant accident.

17th Commission Meeting

Location:
Fukushima Terrsa, Fukushima Pref.
Date:
May 29, 2012

Witness: Yuhei Sato, Governor of Fukushima Prefecture at the time of the accident.



Yuhei Sato

Pre-accident conditions:

1. The central government and TEPCO stated that risks relating to nuclear disasters were appropriately mitigated and that the area was protected under the defense-in-depth philosophy.
2. Evacuation from the 2-kilometer zone was a decision made by the prefectural government on its own, because the central government had not acted swiftly enough. However, the evacuation order was not properly disseminated due to disruption of communications systems. Later, the evacuation orders issued by the central government were shared through the media, and the prefectural government received no concrete directives from the central government. As a result, residents were forced to experience an extremely difficult and disruptive evacuation.

Implementation of plutonium-thermal at the plant

1. One of the three conditions the prefectural government presented to the central government on making a decision on plutonium-thermal use in Unit 3 of Fukushima Daiichi was that it must achieve the same level of earthquake-proof safety as the interim report of backchecks performed for Unit 5. However, Sato claims that when plutonium-thermal was implemented in Unit 3, he did not know that the backcheck did not include anti-tsunami measures like those for Unit 5.
2. Sato further claims that he did not know about the special subsidy that was part of the plutonium-thermal project even though he implemented it.

Future tasks:

1. Sato pointed out that having divided administrative functions is detrimental to securing nuclear safety, and stated his opinion that unifying multiple functions is strongly desired.
2. There was conflicting information, including information about SPEEDI. Also information sharing and communication at the emergency response center was not sufficient, and the prefectural government had organizational issues. Sato said that he wants to reconsider crisis management. He commented that it is crucial that communication of insights, organization, and reliable individuals all act in close concert to prevent future accidents.
3. National support has been broadly extended to Fukushina and its people since the disaster. To reciprocate, Sato said that he wants to contribute by building a community with the promise not to let a similar disaster ever happen again.

18th Commission Meeting

Location:
The National Diet of Japan
Date:
June 8, 2012

Witnesses: Masataka Shimizu, president of TEPCO at the time of the accident.

Miscommunication:

1. President Shimizu was "not aware that the Kantei did not trust TEPCO's response

regarding venting" when he returned from his business trip. Also he "found out" that the Prime Minister had interpreted the proposal regarding withdrawal as "full withdrawal" only after the Prime Minister said so. It seems that Shimizu lacked an understanding of the gap between how the Kantei perceived the situation and how TEPCO perceived it. The Kantei and TEPCO misunderstood each other and there was mutual mistrust, resulting in discrepancy over the interpretation of the word "evacuation."

2. In addition to his testimony, the Commission's investigation has confirmed the fact that the staff was on the ground striving hard to resolve problems with the reactors, and had not thought about withdrawing from the site. No evidence has been found either that TEPCO had made a decision to "fully withdraw."
3. Based on what the Commission has found, nuclear reactors in serious states were ultimately kept under control because of the people on the ground, who had a good grasp of the reactor conditions, as well as a sense of responsibility to remain on-site throughout the crisis.
4. To this end, TEPCO should not have turned to the Kantei for instructions. Instead, people on the ground or someone qualified to make technical judgments about the situation should have made decisions, as exemplified by the decision to inject seawater.
5. This raises an important argument over the position of the operator and the legitimacy of the intervention by the Kantei, which lacked the nuclear expertise.
6. Shimizu highlighted the significance of having earthquake-resistant buildings by mentioning that "it is frightening to think what would have happened if TEPCO did not have it." Various preparations assuming an even worse case are needed. The importance of protecting the safety of workers at nuclear power plants in order to protect the lives of the public is now clear.

Location:
The National Diet of Japan
Date:
June 9, 2012

19th Commission Meeting

Summary of survey results: The survey results showed that the government's delay in transmission and communication of information concerning the accident led to the subsequent confusion. From the perspectives of the evacuees, ad-hoc instructions caused many people to evacuate multiple times, in some cases to areas with high radiation doses, and/or with only barest necessities. The voices and thoughts of evacuated residents who do not have other places to turn to were very clear. The issues are not resolved yet. Proper measures should be considered as soon as possible. We will communicate this message to the Diet.

Glossary of terms

Acute radiation disorder An acute illness resulting from a high dose usually exceeding 500mSV to most or all of the body in a short period of time.

B.5.b The section of the 2002 NRC Security Order that addresses damage from fire or explosion such as could occur from the impact of a large commercial aircraft.

Backcheck A review of the safety of a nuclear power plant—a term peculiar to the Japanese nuclear industry.

Backfit The modification of or addition to systems, structures, components, or design of a plant or a facility; or the design approval or manufacturing license for a facility; or the procedures or organization required to design, construct, or operate a plant or a facility.

Becquerel Bq The unit of radioactivity in which one nucleus decays per second.

Condensate storage tank A tank containing water used for a reactor's cooling systems.

Condensate water transfer pump The pump for water from the condensate storage tank.

Containment vessel The gas-tight shell around a nuclear reactor.

Core damage Damage to the central part of the reactor that contains the fuel and produces heat.

Defense-in-depth The practice of having multiple, redundant, and independent layers of safety systems to safeguard the reactor core.

ECCS Emergency Core Cooling System

ERSS Emergency Response Support System – a system of information sharing between nuclear power plants and government agencies designed to facilitate a coordinated and effective response from the national government.

FEPC Federation of Electric Power Companies (Hokkaido Electric Power Co., Hokuriku Electric Power Co., Chubu Electric Power Co., The Chugoku Electric Power Co., The Okinawa Electric Power Co., Kyushu Electric Power Co., Shikoku Electric Power Co., The Kansai Electric Power Co., Tokyo Electric Power Co. and Tohoku Electric Power Co.) – A federation of the ten privately owned electric power utilities created in 1952 to facilitate communication and cooperation between them.

Filtrate tank Part of the water injection backup line of the plant, connected by a pump to the water tank that draws from Sakashita dam.

gal A unit of acceleration defined as one centimeter per second squared.

hardened vent A separate vent pipe designed to withstand higher loads during an accident such as a station blackout, and routed to an elevated point outside the reactor building.

HPCI High pressure coolant injection system - the first line of defense in the emergency core cooling system. HPCI is designed to inject substantial quantities of water into the reactor while it is at high pressure so as to prevent the activation of the automatic depressurization, core spray, and low pressure coolant injection systems.

IAEA International Atomic Energy Agency - an international organization that seeks to promote the peaceful use of nuclear energy, and to inhibit its use for any military purpose, including nuclear weapons.

IC Isolation condenser – a heat exchanger located above containment in a pool of water open to atmosphere. In operation, decay heat boils steam, which is drawn into the heat exchanger and condensed; then it falls back into the reactor.

INES International Nuclear and Radiological Event Scale – a seven-level scale for assessing and communicating safety information regarding nuclear and radiological incidents.

JNES Japan Nuclear Energy Safety Organization – an incorporated administrative agency established to ensure safety in the use of nuclear energy, which works in conjunction with NISA.

Kantei The Prime Minister's Office - The building housing both the Prime Minister's official office and residence. In this report, "Kantei" most often refers to the Prime Minister and the ad hoc group on the 5th floor, which was responsible for the government's response to the accident.

LOCA loss of coolant accident – a mode of failure for a nuclear reactor that can result in core damage, unless it is mitigated by ECCS.

Make-up system A system used to add water to the reactor coolant system under normal operating conditions.

M/C High voltage metal-clad type switchgear - In an electric power system, switchgear is the combination of electrical switches, fuses or circuit breakers used to control, protect and isolate electrical equipment.

METI Ministry of Economy, Trade & Industry

MEXT Ministry of Education, Culture, Sports, Science, and Technology.
Millisievert mSv A unit of equivalent radiation dose.
NAIIC Nuclear Accident Independent Investigation Commission
NISA Nuclear and Industrial Safety Agency – a government regulatory agency under METI.
NSC Nuclear Safety Commission of Japan -- a government administrative body under the Cabinet Administration Office (CAO) that oversees the regulators and the operators.
PBq PetaBecquerel. 10^{15} Bqs.
Reactor A device in which a fission chain reaction can be initiated, sustained and controlled.
RCIC Reactor core isolation cooling system – RCIC is a feedwater pump meant for emergency use. It is able to inject cooling water into the reactor at high pressure.
SBO Station blackout – a complete loss of alternating current electric power to the station.
SCRAM Safety Control Rod Axe Man – Rapid shutdown of a nuclear reactor where fission is halted by inserting control rods into the core.
Shelter-in-place order An order to take immediate shelter in a location readily accessible by sealing it off from outside contaminants and shutting off all air circulation systems. For many residents this meant their own houses.
SPEEDI System for Prediction of Environmental Emergency Dose Information
SR Safety relief valve – a safety device designed to protect a pressurized vessel or system during an overpressure event.
TEPCO Tokyo Electric Power Company, the operator of the Fukushima Daiichi Nuclear Power Plant
Venting A system designed to vent accumulated hydrogen gas in the reactor buildings.
Yield strength Yield strength is the stress beyond which a specified amount of permanent deformation of a material occurs.
480V bus cross-tie breaker A cross-tie breaker is a connection between electric power systems by means of which each can interchange power with the other.

Senator INHOFE. I thank all of you for your service and for being here. We are looking forward to working in an aggressive way to enhance nuclear power in America.

Thank you very much.

[Whereupon, at 11:35 a.m., the committee was adjourned.]

[Additional statements submitted for the record follow:]

STATEMENT OF HON. THOMAS R. CARPER,
U.S. SENATOR FROM THE STATE OF DELAWARE

Thank you, Chairman Inhofe, for convening this hearing on the Nuclear Regulatory Commission's (NRC's) fiscal year 2016 budget. I'd like to welcome back the NRC commissioners to the committee and welcome Chairman Burns to his first hearing before us as chairman of the NRC.

For this country to meet its climate and clean air goals, we must have nuclear in the energy mix. And in order to do that, we must ensure we have a safe nuclear industry here at home and around the world.

Fortunately, the NRC is considered the gold standard when it comes to nuclear safety regulatory agencies. As a result, we have some of the safest nuclear plants in the world. However, with nuclear safety we can never rest on our laurels. Science and technology are constantly evolving and, in response, the NRC must adapt to ensure the public continues to be protected. I believe the NRC is up to the challenge.

Today we have the opportunity to hear how the NRC is using its budget to update our nuclear safety regulations to ensure accidents like Fukushima don't happen on American soil and address the many other challenges faced by the commission on a day to day basis. I look forward to today's dialog with the commission and my colleagues.

STATEMENT OF HON. BERNARD SANDERS, U.S. SENATOR
FROM THE STATE OF VERMONT

There are very serious concerns about nuclear power: concerns with the safety aspects, and concerns about how the nuclear industry's reliance on Federal subsidies hides the true costs of nuclear power. There are also very serious concerns about a potential disaster on the scale of Fukushima, which would not only cost taxpayers potentially billions of dollars but also do untold damage to our economy and infrastructure.

This oversight hearing will cover a wide range of very important issues, but I would like to focus on one specific issue, and that is the need to provide a strong role for State in the decommissioning process when a nuclear plant shuts down.

Currently, the existing rules involve only the NRC and companies who license nuclear plants to negotiate a decommissioning process. As of now, no State with a plant that is set to be decommissioned has a role in that process. States are merely observers in the process—they can hold public meetings, they can provide input on what is important to the communities that will be affected, but at the end of the day the company and the NRC work out the agreement. On the face of it, that just doesn't make sense. The people of the State, whether it's my State of Vermont or any other State with a plant being decommissioned—should have the right to have a place at the table.

The Vermont Yankee nuclear plant began the decommissioning process last December. I have very serious concerns about the way Entergy plans to carry out the decommissioning of Vermont Yankee, including worries about Entergy's limited efforts to address radioactivity levels at the plant, and worries about Entergy's ability to finance all of the work that must be done in the decommissioning process. And on Entergy's timeline, decommissioning will take more than 60 years to complete. Imagine having a hulking mass of radioactivity in Southern Vermont deteriorating for 60 years. Nobody I know in Vermont wants that to happen.

Now, the State of Vermont, which will have to deal with the consequences of the decommissioning process, was shut out from giving any input before Entergy submitted its decommissioning plan to the NRC, so we now have a plan that the State of Vermont and surrounding communities take serious issue with, but that was accepted by the NRC without any sort of official decisionmaking process.

Because the NRC's rules on decommissioning provide no meaningful role to States in crafting the decommissioning plan, Vermonters have been left outside looking in as the NRC and Entergy make key decisions that affect our State.

The fact that licensees like Entergy could adopt a decommissioning plan that ignores the interests and needs of Vermonters and leaves the State with no recourse is fundamentally unfair and unreasonable.

This policy doesn't just affect Vermonters. Right now, there are nuclear plants being decommissioned across the country—in California, Florida, New York, Wisconsin, Pennsylvania, and Ohio. All of these States have a serious stake in making sure that these plants are decommissioned safely and responsibly, and their interests should be reflected in the decommissioning plan.

There are very serious economic impacts to the surrounding communities when a plant closes—job losses and a decrease in the tax base. There are likewise the environmental impacts to be considered. Given how significantly these communities are affected during the decommissioning process, States should have a seat at the table when the NRC and the companies are drafting plans to decommission these plants.

My bill, which is cosponsored by Senators Boxer and Markey, addresses this very serious flaw in the decommissioning process by requiring the NRC to review decommissioning plans before they are finalized, and to also provide the opportunity for States to provide feedback and shape the plans before they are accepted.

By doing this, my bill gives States and surrounding communities a voice in the decommissioning process and a way to hold licensees accountable if they do not stick to that plan.

This clearly is not a partisan issue, and is not even a rural or urban issue. It is a simple question of whether the people in these States get a seat at the table.

I look forward to working with Senators Boxer and Markey on legislation to provide increased safety and more accountability during the decommissioning process.